

THE FINAL REPORT

OF THE

IRISH MILK COMMISSION, 1911.

First Report of the Commissioners is printed separately as [Cd. 6683/13.]

Appendix to First Report of the Commissioners, 1 Vol., is printed separately as [Cd. 6684/13].

Second Report of the Commissioners is printed separately as [Cd. 6936/13].

Appendix to Second Report of the Commissioners, 1 Vol., is printed separately as [Cd. 6937/13].

Appendix to Final Report of the Commission is printed separately as [Cd. 7134].

Presented to both Houses of Parliament by Command of His Majesty.



LONDON:

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1913.

[Cd. 7129.]

Price 6½d.

19487

DUBLIN CASTLE,

24th October, 1913

SIR,

I have to acknowledge the receipt of your letter of the 23rd inst., forwarding, for submission to His Excellency the Lord Lieutenant, the Report of the Commission on Irish Milk Supply.

I am,

SIR,

Your obedient Servant,

E. O'FARRELL.

The Secretary,

Irish Milk Supply Commission

5, Upper Castle Yard,

Dublin Castle.

BY THE LORD LIEUTENANT-GENERAL AND GENERAL GOVERNOR
OF IRELAND.

ABERDEEN.

WE, John Campbell, Earl of Aberdeen, Lord Lieutenant-General and General Governor of Ireland, hereby nominate and appoint :—

PATRICK J. O'NEILL, Esquire, J.P., Chairman of the County Council of the County of Dublin;

Sir JOHN LENTAIGNE, F.R.C.S.I.;

GEORGE A. MOORHEAD, Esquire, F.R.C.S.I.;

ALEC WILSON, Esquire, of Belvoir Park, Belfast;

DERMOD O'BRIEN, Esquire, President of the Royal Hibernian Academy;

JOHN R. CAMPBELL, Esquire, B.Sc., Assistant Secretary in respect of Agriculture of the Department of Agriculture and Technical Instruction for Ireland;

ALBERT E. METTAM, Esquire, M.R.C.V.S., Principal in the Royal Veterinary College of Ireland;

Lady EVERARD, of Randlestown, Navan; and

Miss MARGARET McNEILL, Assistant Inspector of Reformatory and Industrial Schools, Ireland;

to be a Committee to inquire into the alleged scarcity in the supply of Milk in some parts of Ireland, and to report upon the causes of the deficiency, where it exists, its effects upon the public health, and the means whereby the deficiency can be remedied; and also to inquire into and report upon the dangers of contamination and infection in the present Milk supply, and the methods best adapted to guard against these dangers.

We further appoint the said Patrick J. O'Neill to be Chairman of the Committee.

Given at Dublin Castle the 8th day of November, 1911, by His
Excellency's Command.

J. B. DOUGHERTY.

BY THE LORD LIEUTENANT-GENERAL AND GENERAL GOVERNOR
OF IRELAND.

ABERDEEN.

WHEREAS We, John Campbell, Earl of Aberdeen, Lord Lieutenant-General and General Governor of Ireland, did by Warrant bearing date the 8th day of November, 1911, appoint Patrick J. O'Neill, Esquire, J.P., Chairman of the County Council of the County of Dublin; Sir John Lentaigne, F.R.C.S.I.; and the several gentlemen and ladies therein mentioned to inquire into and report as to certain questions affecting the supply of Milk in some parts of Ireland;

AND WHEREAS one of the Members of the Committee so appointed, namely, Sir John Lentaigne, has tendered to Us his resignation of his appointment as one of the said Committee;

Now We do appoint Sir Stewart Woodhouse, M.D., to be one of the Committee for the purpose aforesaid in the room of the said Sir John Lentaigne, resigned, in addition to and together with the other members of the Committee whom We have already appointed.

Given at Dublin Castle the 2nd day of January, 1912, by His
Excellency's Command.

J. B. DOUGHERTY.

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FINAL REPORT.

To His Excellency the Lord Lieutenant-General and General Governor of
Ireland.

MAY IT PLEASE YOUR EXCELLENCY,

(1) In accordance with the terms of Your Excellency's warrant of the 11th November, 1911, appointing us to inquire into the milk supply of Ireland, we have the honour to report that we have had 77 meetings, 56 of which were for the purpose of taking evidence. We have held sittings in Dublin, Belfast, Newry, Cork, Skibbereen, Limerick, Ennis, Killarney, Tralee, Galway, Clifden, Mullaranny, Castlebar, Tullamore, Mullingar, Waterford, Enniskillen, Sligo, Killybegs, Londonderry and Omagh, in Ireland; and in Manchester and Birmingham, in England. We have inspected a number of creameries and their auxiliaries, and we have examined 281 witnesses. The witnesses have been of a widely representative type and have included nominees of Public Departments, City Boroughs, Urban and Rural District Councils; members of the medical and veterinary professions; wholesale and retail milk vendors; clerical witnesses; witnesses representing the agricultural interest, and members of the Women's National Health Association.

(2) In visiting the provincial centres in Ireland we desired to ascertain what facts concerning the milk supply were common to the whole country, and what facts were peculiar to certain localities or to a number of localities. These inquiries could not be conducted wholly in Dublin. It was necessary to visit most of the principal towns, and certain of the smaller towns typical of their class, to take the evidence of representative witnesses living in the district who could not, perhaps, have been induced to attend in Dublin. Where evidence of a similar character was given in several centres the effect was cumulative, and strengthened our hands in making our recommendations. Where it was diverse, it acquainted us with the different points of view and enabled us to adjust our recommendations to meet conflicting interests. Sometimes, where it was exceptional, it brought to our notice needs which might have been overlooked but which should not be ignored. This procedure has prolonged our labours, but it has given us reliable and comprehensive data and a valuable insight into local conditions. A secondary advantage of our provincial sittings has been that local interest in the questions connected with the milk supply has been aroused. Our meetings have at all times been open to the press and the public; in several places the attendance, and in all cases the press reports, were most gratifying.

(3) We desire to mention at the earliest opportunity the cordial assistance we have received everywhere in the course of our inquiries. It would be difficult to single out any one class of witness for special acknowledgment. The local authorities have assisted us in every possible way by furnishing us with information and generously placing accommodation at our disposal. The medical profession has been largely represented and its members, besides giving much valuable evidence, have testified their interest in the question of the milk supply, which so vitally affects the public health. We are also under deep obligation to the Women's National Health Association. The extent of the co-operation of its branches cannot be measured merely by the number of their witnesses, because, in addition to giving public evidence, the branches assisted to arouse considerable local interest in our proceedings and in the question of the milk supply generally.

We desire specially to acknowledge the very cordial and whole-hearted assistance we received from the public authorities of the cities of Manchester, Birmingham, Liverpool, Glasgow, Sheffield and Leeds. Our object in visiting England was to ascertain the difficulties which had been experienced in large centres of population in securing and maintaining an adequate supply of pure milk, and how the diffi-

cultures had been surmounted. We invited the Medical Officer of Health and the Chief Veterinary Inspector of each of the cities named above to give evidence; also Professor Delépine, the well known bacteriologist associated with the Public Health Laboratory of Manchester; and without exception the invitation was accepted. Nothing more could have been done by these gentlemen than was done, and we take this opportunity of expressing our indebtedness to them for their valuable assistance. We desire also to express our thanks to the United States Department of Agriculture for placing at our disposal a number of pamphlets on subjects relating to the production, use and preservation of sanitary milk; also to Dr. Cameron, of the Department of Agriculture, Melbourne, for particulars of a proposed scheme for a municipal supply of pure milk for infants, which had been brought under our notice by Dr. Wood and Dr. Barrett of Melbourne; and to the Medical Officers of Health of Battersea and Lambeth for information concerning the Infant Milk Depots in those Boroughs.

We have to mention with regret the loss of the services of Sir John Lentaigne as a colleague at an early stage of our proceedings. It was with much reluctance that Sir John resigned his place on the Commission owing to the pressure of his professional duties.

(4) The subject into which we were appointed to inquire divides itself naturally under two principal heads; (a) the means whereby an adequate supply of milk for domestic purposes can be secured; (b) the steps necessary to be taken to ensure that the supply shall be free from contamination by dirt or agents producing disease.

The value of Milk as a food.

(5) It might almost seem unnecessary to speak of, and still less necessary to emphasise, the value of milk as an article of human food, to state that for infants and young children it is an essential, and to point out that milk is, perhaps, the cheapest of all foods, taking into account its nutritive properties. It has, however, been borne in on us by abundant evidence from all quarters that the intrinsic value of milk as a food is not properly appreciated, especially among the labouring class. The insufficient use of milk is often due to the difficulty of obtaining it, or to poverty or comparative poverty, though where the latter cause is assigned it has frequently been stated that other more expensive foods are used in substitution. But even where milk is obtainable and there exist the means to buy, we have found that milk, at least in sufficient quantities, has been neglected as a food. Its importance as a food for all classes of the community cannot be over-stated. By virtue of its composition it has a high nutritive value and it contains the essential ingredients for life, viz., proteins, fats, carbohydrates, and mineral salts. The proteins in milk are of a very special kind, namely, phospho-proteins, which can be obtained only in milk. The fats and salts of milk also are very valuable dietetically. Above all, recent experiments have demonstrated that there is in milk in its natural state subtle ingredients which give to it a nutritive value out of all proportion to its bulk. The opinion of an authoritative witness is that pure milk is an indispensable article of human food and that no other food can be substituted for it to take precisely the same place. This is especially true in the case of infants and small children. The ideal food for infants is, of course, the milk of a healthy mother. In the milk of the human being and of animals there are specific differences in the milk proteins, in the fats, and in the salts, so that humanised cow's milk is never exactly the same as human milk. When, however, the mother's milk is not available, and after the child is weaned, the milk of the cow or goat is, during the earlier years of life, a food of primary importance. Separated milk, that is milk deprived of its fats, is not suitable for infants; and condensed milk is an inferior substitute for fresh milk. In certain cases and for special occasions condensed milk may be used with advantage; a baby sometimes thrives better on condensed milk than on ordinary milk mixtures, and during epidemics of summer diarrhoea and typhoid fever, or when milk is liable to be contaminated, condensed milk may best be used. These remarks apply only to condensed whole milk, not to the many brands of condensed *separated* milk which are wholly unsuitable for the feeding of infants and are the more dangerous because the poor persons who usually buy them believe all condensed milk to be of equal food value. The result of the continuous use of condensed separated milk is most detrimental and is universally condemned by medical men. Of the manufacture and composition of condensed milk, and its liability to contamination, we shall speak again (see sections 103 and 104, page 59).

PART I.—THE MILK SUPPLY.

SCARCITY IN CITIES AND LARGE TOWNS.

(6) The problem that has confronted us in the large towns of Ireland as to the scarcity of milk is not a physical but an economical one. In the strict sense of the word there is no scarcity in the large centres of population; that is to say, the supply is always equal to the demand so long as the money to pay for it is forthcoming. It has, however, been stated that there is in every town a large portion of the community which is either unwilling or unable to pay the price demanded.

(7) The unwillingness arises frequently from ignorance of the value of milk as a food. Whereas, in the poor man's budget, money is grudged for milk, a larger amount is often spent on other foods which are inferior as a means of sustenance. We fear that the scarcity of milk in the wage-earner's home is too often accounted for by the amount of money spent on alcoholic drinks, especially porter. So far as this is the case, the chief hope lies in the enlightenment of those concerned as to the relative value of foods. We commend to the notice of social reformers, philanthropic bodies, and local authorities, the need of disseminating among the public information in a popular form showing the value of milk compared with various other foods.

Webb, 402-4

In some cases the unwillingness of the poor to buy fresh milk arises not from a want of proper appreciation of the value of milk as a food, but from a conviction that the milk sold in the poorer parts of our cities is of such poor quality as not to be worth the money charged for it. The implication is that milk of an inferior quality is sold in the poorer districts. From evidence given to us we believe that the poor are more liable to victimisation than their well-to-do neighbours, and it would be a matter for deep regret if, by reason of laxity on the part of the Food and Drugs Inspector, or a failure of magistrates to impose adequate punishment on offenders convicted of adulteration, the poor were discouraged from using milk in such quantities as their means enable them to procure.

(8) So far as the failure to procure milk is due to poverty one obvious remedy is to try to secure a reduction in the price in order to bring it, if possible, within the straitened means of the poor. The case we have in mind is not that of a person who is actually penniless, to whom even the lowest price is a matter of indifference, but the labourer with a wife and children, to whom the difference of 3d. a quart is a matter for consideration. The price of milk in towns depends on varying conditions, as, for example, the season of the year, the distance from which the supply has to be brought, the cost of production and distribution; but speaking generally, the average retail price of milk is 3d. a quart. So long as the dairy trade is carried on under existing conditions this price is not excessive, when the risks of the trade, its exacting nature, the cost of food-stuffs, and the difficulty of getting suitable labour and reliable distributors are borne in mind. If any of these elements could be eliminated the price of milk might accordingly be reduced, but with one exception they are fairly constant. The possible exception is in the cost of distribution.

Hatch, 3441.

The present practice is for each vendor to send his cart over a wide area, supplying a customer here, another there, and a third somewhere else. In this manner the same district is supplied by several vendors. It is unnecessary to point out that this method of distribution is uneconomical, but it is not perhaps generally realised that it is the customer who pays the extra cost entailed. We have been informed by those in the trade that the cost of distribution, *i.e.*, the services of a man, horse and cart, is about 3d. a gallon. We find that in towns where milk is required regularly it must be delivered, because people will rather do without it than fetch it; so that, while the cost of distribution cannot, of course, be eliminated, it might at least be reduced if, in the poorer districts, the inhabitants of the same street, or a number of adjoining streets, would agree to take their supply regularly from the cart of one particular dairyman. If such a demand were organised, possibly by the municipal authority or by a philanthropic agency like the Women's National Health Association, something in the nature of a contract price might be obtained, street by street; the regularity of the supply at a lower rate would induce a regular demand, and eventually, from habitual use, milk would come to be regarded not as a luxury, but as an essential, and be one of the last, instead of one of the first, things to be sacrificed in time of financial stress.

Mixon, 7496-7.

Young, 2615.
2665.Dr. E. Bell,
7062-7.

Cresswell, 9333-41.

Separated Milk.

(9) For those unable to afford fresh milk, an alternative is the purchase of separated milk. It has the superlative merit of cheapness. It contains all the elements of whole milk except the fats, as will be seen from the following figures:—

Wilson, 2516.
Gordon, 5127.

PERCENTAGE COMPOSITION OF

| MILK. | SEPARATED MILK. |
|------------------------------|----------------------|
| Fat—3 to 4·5 per cent. | 1 per cent. |
| Proteids—3 to 3·5 per cent. | 3·1 to 3·6 per cent. |
| Sugar—4 to 5 per cent. | 4·1 to 5·2 per cent. |
| Mineral matter—7·5 per cent. | 7·8 per cent. |

Sir C. Cameron,
324.
Prof. Thompson,
1700 1, 1729.
Prof. Thompson,
1721.
Webb, 4116-7.

The value of separated milk compared with whole milk is put by Sir Charles Cameron, Analyst for several counties in Ireland, roughly at as 1 is to 2. Dr. Thompson, Professor of Physiology in the University of Dublin, part of whose work is to teach the value of foodstuffs, considers that separated milk is an article which could be made a useful food for adults. It is unnecessary to say that the use of separated milk is not recommended to those who can afford to buy whole milk. Also it must be distinctly understood that separated milk is not a suitable food for infants, because in the feeding of infants the milk fats are essential elements; but for adults and children over three or four years of age, who are able to obtain fats in other articles of diet, separated milk is both a nutritive and economical article of food. Unfortunately there is a popular prejudice against the use of it. It is alleged that it is unpalatable; that it is all right when it is fresh, but "that after a couple of hours it has a vile, sour, venomous taste." A medical witness who spoke highly of the nutritive value of separated milk and deplored its disuse by the peasantry, and who cannot therefore be considered an unreasoning hostile critic of separated milk, corroborated and explained the general dislike of it. Milk, he said, separated by hand separators is unexceptionable; but that returned by the creameries in his district is unusable for food, owing to the objectionable greasy flavour it acquires and subsequently to the bad smell arising from it. The popular prejudice, so far as it is well founded, is due to the changes which occur in the character of the milk consequent on the conditions under which the separation of the cream takes place. In order to secure an effective separation, the milk is heated to a temperature of 140 or more degrees Fahrenheit, which has the effect of changing the normal bacterial content and in consequence favouring putrefactive changes, which produce the disagreeable flavours referred to. This is a real danger operating against the use of separated milk. Prejudice once created against creamery separated milk extends to all separated milk, even to that produced from hand separators. If, therefore, separated milk is to become an article of food in town and country, it must be produced under proper conditions, namely, the milk after being heated for the extraction of its fats should be cooled down to a low temperature; be kept at a low temperature during its carriage to the consumer, and afterwards be stored in a cool place in the house. It has been suggested that after the separated milk has been heated and cooled, a further safeguard would be the introduction of cultures of the lactic acid bacilli so as to bring about the natural souring of the milk. This is a question which we think is worthy of consideration and might well be made the subject of investigation.

Burke, 14095-6.
McCarthy, 14294.
Pinnegar,
14661-3.

Dr. O'Meara,
14621-33.

Delapine, 31742-6.

McWookey,
441-437, 450-6.

Dr. O'Meara,
14368-4.
Dr. Maginn,
13414-6.

Cotter, 13794-73.

Delapine, 31749.

Recommendation.

Trimble, 6011-22.

Mrs. O'Brien,
18735-43.

MILK DEPOTS FOR INFANTS.

(11) This brings us to the consideration of the policy of cheapening milk (advocated by some witnesses and opposed by others) by the establishment of State- or Rate-aided milk depôts. We shall discuss the larger question of subsidising the milk supply for adults when we deal with the difficulty of obtaining milk in small

towns and in rural districts. But that part of the question which relates to the provision of specially prepared milk for infants, and particularly for sick infants, is essentially a town problem and may be appropriately dealt with here. There are in existence at the present time in many towns in England and abroad *dépôts* which supply milk for children. Such, for instance, are the *Consultations de Nourrissons*, attached to maternity hospitals. The *Gouttes de Lait* are common throughout France. Like the *Consultations de Nourrissons*, they encourage breast feeding, and only supply artificial feeding for those unable to obtain the breast. They are philanthropic organisations, supported by voluntary contributions and sometimes aided by municipalities. In some cases they have been taken over altogether by the municipalities. We are informed that the *Gouttes de Lait* supply milk, which is humanised and sterilised, to the very poor without payment, at a reduced price to those who can afford to make part payment, and at full cost price to those who are in good circumstances and who are willing to pay extra for reliable milk.

London, 1905

Lady Talbot Milk Institute, Melbourne.

(12) In this connection we shall refer in detail first to the action taken by the city of Melbourne, as set out in the evidence of Dr. Atkinson Wood and Dr. James Barrett, both of Melbourne, because it shows the reasons why it may be regarded as a public duty to supply milk produced and handled under special conditions for infants. The attention of medical men in Melbourne having been drawn to the statement that whenever the temperature of the air rises to 60°, babies which are not breast fed begin to die, the cause of death being usually infantile diarrhoea, investigations were made locally and it was ascertained that the assertion held good in Melbourne. The cause has since been shown to be the decomposition of milk, which becomes active when the temperature is over 60°. It was estimated that in Melbourne and its suburbs upwards of 800 infant lives were lost annually because of the absence of preventive measures. For many years the medical profession had tried to educate the public as to the necessity of having a separate milk supply for children under two years of age. The result was not encouraging until in 1908 Lady Talbot, wife of Sir Reginald Talbot, then Governor of Victoria, interested herself in the matter. She called a meeting at the Government House and financial support was obtained sufficient to start an institute, known as the Lady Talbot Milk Institute, for the supply of pure milk for children in the summer months. Dr Wood details in his evidence the precautions taken to secure milk from tuberculin tested cows and to ensure cleanliness of production, handling, and distribution. Nurses are employed to visit the children who take the milk, for the purpose of recording the weight and progress of each child, and to instruct the mothers in the care and cleanliness of children. The urgent need of such instruction is shown in the report of the nurse quoted in Appendix A, page 189, of the third volume of the Evidence.

Dr. Barrett,
1909a.

Dr. Wood, 1907.

Wood, 1911, 1908.

The institute is a charity aiming at supplying (a) sick infants of poor parents with free milk; (b) healthy infants of poor parents at less than cost price; and (c) infants of rich parents at a little over cost price. The cost of the milk obtained under the stringent regulations laid down is, of necessity, very much greater than that produced under ordinary conditions for general household use. The highest price charged to any applicant is the local commercial rate, which is 3d. per pint, but this does not cover the cost price, which exceeds 5d. per pint. Many applicants unable to pay 3d. a pint pay 2d. or 1d. a pint, and in a few exceptionally poor cases the milk is supplied free of charge. The figures appended, taken from the Institute's report for the year ended 30th June, 1911, show the striking results obtained. The following table shows the deaths per 100 births in those districts where the "Talbot" milk has been distributed, also the deaths per 100 births in the same districts for the two years prior to the distribution:—

Wood, 1904.

| | 1907 and 1908. | 1909 to 1911. | Reduction per cent. |
|------------------|----------------|---------------|---------------------|
| Melbourne, | 9.8 | 7.8 | 20 |
| Fitzroy, | 11.8 | 8.7 | 31 |
| Collingwood, | 10.7 | 7.0 | 37 |
| Richmond, | 8.7 | 7.8 | 9 |
| Prahran, | 8.1 | 6.6 | 15 |
| South Melbourne, | 9.8 | 8.0 | 18 |

For the purpose of comparison, the deaths per hundred births in the following municipalities with similar number of births to the above districts are here set out. "Talbot" milk is not supplied in these districts.

| | 1907 and 1908. | 1909 to 1912. | Reduction per cent |
|------------|----------------|---------------|--------------------|
| Brunswick, | 93 | 85 | 8 |
| Footscray, | 84 | 77 | 7 |
| Geelong, | 87 | 79 | 8 |
| Ballarat, | 88 | 100 | 12 |

As to finance, apart from the initial donations the total public subscription is less than £20 yearly; so that practically the Institute is dependent on the grants made by the municipal councils and a State grant of £1,000 a year. The justification for this expenditure of public money is summed up in a reply by Dr. Wood: this milk "is medicine for the infants. It is not supposed to be taken by the other members of the family."

(13) We have referred somewhat fully to the foregoing case, because it sets forth the arguments in favour of Rate and State aid for milk depôts for children in cities. The deaths from infantile diarrhoea, due to decomposition of milk, are more numerous in the city than in the country, and more numerous in the densely populated suburbs and poorer parts than in the richer. The Talbot Institute having shown that infantile mortality can be appreciably reduced by providing milk specially produced, handled and distributed, though at a cost in excess of commercial milk, has received aid from public sources, the sentiment in Victoria being that it is cheaper and better to save the babies and bring up Australian citizens than to pay money to import emigrants from other countries.

Liverpool Milk Depôts for Infants.

(14) To come nearer home, we received evidence of what is being done on the same lines by the municipality in Liverpool. In 1901, on the recommendation of Dr. Hope, the Medical Officer of Health, the Public Health Committee inaugurated a scheme for the supply of humanised sterilised milk for the infants of all classes of the community, subject to the proviso that the mother is unable to suckle the child. The supply is given chiefly on the recommendation of medical practitioners, who are acquainted with the cases. A basket, containing a number of bottles, each of which is sufficient for one feed, is provided every twenty-four hours. There is no necessity for the mother to measure or decant the milk; all she needs to do is to place a teat on one of the bottles and feed the child, the object being to minimise the risk of contagion in the home. The milk may be fetched from any of the five depôts scattered about the city, or it is delivered under an arrangement made with eighteen or twenty dairies. The price charged is 1s. 6d. for a week's supply. Out of 724 cases on the books in 1912, the full price was paid in 630 instances; in 68 cases a reduced price was charged, and in 26 cases the milk was given absolutely free. The 1s. 6d. represents the actual cost of the milk—it does not pay for handling and administration; the deficit, which ranges from £2,000 to £3,000 per annum and is equal to about 50 per cent. of the entire expenditure, is met out of the sanitary rate, and is met by a rate equal to about one-sixth of a penny in the £. The scheme is regarded as analogous to any other action that is taken for the purpose of improving the health of the community. The scheme since 1907 has been extended to include the supply of milk to nursing mothers.

The justification for the undertaking is mentioned in the Report of the Medical Officer of Health for 1911, viz., that it is polluted milk and unsuitable artificial foods which cause the high rate of infant mortality, and as it is impossible by municipal administration to reach and deal with all the sources of pollution, the necessity arises for these infants' milk depôts. As to the results, it is stated in the same Report that "out of the 13,789 coming promiscuously to the Depôts, at varied ages and in conditions of health below the average, the mortality was 93 per 1,000, as against 144 per 1,000 for the whole city, and 81 to 95 for the best districts and 219 to 243 for the worst, for the five years. But it must be remembered that in the rate for the whole city, and for the best and worst districts, are included also, breast-fed infants; clearly if breast-fed infants were excluded, and artificially-fed infants only taken into account, the rate of mortality amongst them would be enormously higher, and

would show even more forcibly the advantages of the sterilized food, which is, of course, an artificial food, over other methods of artificial feeding." As the dépôts have been open for twelve years, it will be seen that they have long ceased to be in the experimental stage.

Infants' Milk Dépôts, Lambeth and Battersea.

(15) We have also received from the Medical Officer of Health for the Borough of Lambeth information concerning the Municipal Milk Dépôt which has been in existence in Lambeth for nine years. Here again the fact is emphasised most strongly that no artificial feeding of infants can in any way compare with natural feeding, and steps are taken to ensure that the dépôt milk shall not be supplied to mothers who are capable of properly and efficiently sucking their offspring but refuse to do so. The object of the dépôt is, as in other cases we have mentioned, to reduce the appallingly high rate of infant mortality from preventable causes. The charge made for the full supply of dépôt milk to persons living within the Borough is 1s. 6d. weekly for an infant under six months old and 2s. weekly for an infant aged six to twelve months. Parents who are unable to afford these prices receive assistance from a private benevolent fund. The deficit is made good out of rates. As a result of the undertaking it is claimed, and supported by statistics, that a large number of infant lives have been saved, and a large amount of infantile illness and suffering has been prevented. The same story comes from Battersea, which dépôt was founded in 1902.

See Appendix B,
p. 189, Vol. 3 of
Evidence.

Infants' Milk Dépôts in Ireland.

(16) We have had an opportunity of visiting the Dublin Pasteurized Milk Dépôt which has been maintained since 1909 by the Women's National Health Association, and we have evidence showing that the results obtained have been highly satisfactory. The general features are very similar to those of the dépôts already described, but the incidental losses show a yearly decrease due to an increasing output of plain pasteurized milk, for general use, on which there is a margin of profit. The milk is received once daily (in the morning) from a contractor of repute, the daily test for butter fat showing an average of 35

Dr. Lennard,
1943, 2067-8.

It is a noticeable feature that these dépôts having been established are not only continued, but are developed and extended. This, to our mind, is the most conclusive proof that they are doing a beneficial work, because they would not be continued at a cost to the ratepayer of hundreds and even thousands of pounds yearly unless it were considered they gave a satisfactory return for the outlay. Other cases could be quoted, if necessary, showing a reduction in the death-rate following the establishment of infants' milk dépôts. We believe, however, that enough has been said to support the recommendation we now make that Irish municipalities and urban authorities should have power to contribute from the rates towards the expenses of such dépôts situated within their jurisdiction, under regulations to be approved by a Central Authority. This power does not at present exist. In the benefits of this supply all infants should be free to participate. We think that the rule obtaining in Lambeth, where the milk is charged for, and those unable to afford it are assisted out of a voluntary fund, is the preferable one for adoption, as removing all chance of abuse; but if, as in Liverpool, a gratuitous or partly-gratuitous supply is given, such assisted cases should be quite the exception and be a small proportion of the total number supplied. This proposal does not inflict an injury on persons in the dairy trade, because the trade does not attempt to supply humanised milk for infants at a price which would bring it within the reach of persons of limited means. "The milk dépôt is not a milk shop worked in opposition to the trade, but simply a municipal institution for the feeding of infants and children who cannot be fed satisfactorily in any other way."

Recommendation.

Extract from
the "Special
Report of
the Lambeth
Milk Depot"

In the case of a milk dépôt which has an efficient pasteurising plant, is under voluntary management, and supplies pasteurised and humanised milk for invalid children (like the Dublin Pasteurised Milk Dépôt), we consider that an urban authority should have power to contribute a proportion of the annual loss sustained through the receipts from the sale of milk falling short of the cost of the milk

Recommendation.

and the current expenditure, provided that the sum contributed by the urban authority shall not exceed a specified poundage rate, and also provided that such milk will be sold at the pasteurising depôt, or the sub-depôts, to any citizen at a price of not less than 3d., nor more than 4d. per pint. The Medical Officer of Health might be appointed an *ex-officio* member of the Society and provisions would naturally have to be made for the withdrawal of the contribution if the Public Health Committee became dissatisfied with the work done by the Society.

Wherever infant milk depôts are worked, they are the means of educating mothers in the proper feeding of infants, so that in every way they tend to reduce the rate of infant mortality by supplying the means of life in its most suitable form and by instructing the mother in the care of her child. There is another highly important consideration. If a child receives in infancy insufficient or innutritious food, though it may live it is with a weakened constitution and it is less able to resist the attacks of disease than if it had been properly fed. The depôt milk is not merely a means of saving life, but also of prolonging life, of reducing the amount of ill-health and thus ultimately of decreasing the financial burdens of the rate-payers. The alternative, so far as the poor at least are concerned, is to buy milk retailed under circumstances which leave much to be desired hygienically, or tinned milk, or other unsatisfactory substitutes. Any scheme for a special supply of milk to infants is costly on account of the difficulty of ensuring the health of the cow and cleanliness on the part of the milkers, distributors, vessels, and all the surroundings. Our recommendation that local authorities be authorised to contribute towards the expenses of infant milk depôts is based therefore on utilitarian as well as on humanitarian grounds.

SMALL TOWNS.

(17) Passing from the larger to the smaller towns, we find that while as a rule there is no scarcity of milk in the summer, there is a partial scarcity more or less acute during the winter season, *e.g.*, from November to March.

Naas Milk Depôt.—Speaking generally, where the population is concentrated the difficulty of obtaining milk is due either to financial inability to buy or to lack of organised means of distribution. The story of the Naas milk depôt illustrates this. It having come to the knowledge of Lady Mayo that two babies in Naas were dying because they could not get milk, and that in other cases it was found to be impossible to get a supply, a milk depôt was opened in the town by the Women's National Health Association. First, the local suppliers were asked if they would increase their supply to meet the necessities of the poor and the answer was a refusal. It was next ascertained that the poor people were really anxious to procure a milk supply. A house was taken, the rent of which is partly paid by letting some of the rooms, and a contract was entered into for a supply of milk of good quality. No attempt is made to undersell other dealers; the price current in the town is charged, and all purchases are for cash. Thus, all persons with money are now able to procure milk, and for the necessitous the St. Vincent de Paul Society and the Women's National Health Association buy books of tickets, which entitle the very poor to a pint of milk for each ticket given. This benevolent enterprise seems to us an ideal one, worthy of imitation. It is managed on strictly business principles and is free from taint of pauperism. At the same time it has a philanthropic side, and, not least important, an educational effect in inculcating habits of cleanliness; because not only is everything in the depôt scrupulously clean, but also, for example, milk is not sold to a person bringing a dirty jug. Private interests are not injured by competition, because in this, as in other instances which have come under our notice, the increased facilities for purchasing milk have led to an increased demand for it. As to the results, the nurse in the district reported that after three months' working of the depôt she saw a great improvement in the appearance of the children.

(18) It may reasonably be expected that what has been done in Naas can be done elsewhere, where the need exists. It cannot be said that the conditions in Naas are favourable, because the town is in a beef producing area; there is not much dairy farming, and there are no creameries. What has been done has been to bring together the producer who is willing to sell and the consumer who is willing to buy. The depôt is a commercial concern, inasmuch as it pays its expenses; and by creating a steady demand it offers sufficient inducement to the farmer to produce a steady

supply. The Naas depôt is in its infancy, but has thriven well so far, and as a proof of the stability of such an undertaking it may be mentioned that a similar depôt has been successfully carried on in Carlow for the last four years. Run on these lines, the vexed question of subsidies from public funds is avoided, as is also the question of control by the local authority, because management by an enlightened public-spirited and philanthropic body is a guarantee of efficiency. The inherent weakness of undertakings promoted by such bodies is the uncertainty of continuous effort by a voluntary association. Philanthropy can materially assist by co-operating with persons or other bodies (e.g. local authorities) to organise a demand and showing that certain things can be done; having demonstrated that, it can be left to private enterprise to carry on the work. This, we are glad to say, has actually occurred. In Limerick, a milk depôt which was opened by the Women's National Health Association is now being carried on as a private business.

18707-10.

It is, of course, unnecessary to point out that the initiation of a body like the Women's National Health Association for the opening of a milkshop is not essential. It has been suggested in various places that farmers and shopkeepers should combine to open milkshops. This can be done without special legislation, all that is required being organisation, capital, and the taking of ordinary business risks.

W. Croft,
11518-9.
O'Reilly,
21184-92.

Lord Rosse's Dairy at Birr

(19) What can be achieved commercially in the way of supplying milk for domestic consumption is strikingly illustrated in the town of Birr. Up to 1909 small dairies existed, but milk was not plentiful. In the year mentioned Lord Rosse began in a small way to supply the town with milk. It was found that there was no difficulty in getting local customers. The people come to the cart as it passes through the street and pay cash for their supply. A certain number of customers have the milk delivered by hand and pay monthly; longer credit is never given. All the milk sold is of uniform quality, and the price, 2½d. a quart, is the same all the year round. The trade has greatly increased, and in 1911 the produce of Lord Rosse's herd was 32,110 gallons, of which 28,000 gallons were sold locally, which is an average of 540 gallons a week. It might be supposed that this increase was made at the expense of the local dealers and represented merely a transfer of trade from a number of small vendors to one large one. Such, however, is not the case. Notwithstanding that Lord Rosse's milk cart is besieged when passing through the town by people of the poorest class, the small local dairies are on the increase rather than on the decrease. The number of cows has increased and the whole milk business is increasing enormously in Birr. The other dairies have given up the former practice of charging 2d. a quart in summer and 3d. a quart in winter, and have adopted the system of charging 2½d. a quart all the year round. The increased demand for milk is most gratifying. Formerly condensed milk was sold in large quantities; now the trade is restricted to country labourers and farmers when their cows run dry. Facilities for the purchase of good milk at a moderate price have increased the demand, and a record such as this gives great weight to Dr. Boeddicker's contention that private enterprise is preferable to public depôts, owned and controlled by the local authority, as a means of supplying milk to an urban district.

Boeddicker, 6100.

5119.
5131.
5095.
5105.

(20) Lord Rosse's experiment is instructive from another point of view. Success has not been achieved in a haphazard way, but by the adoption of practical means methodically carried out. The dairy herd was originally made up of ordinary Irish cows. Gradually the herd has been improved and all cows re-acting to the tuberculin test have been weeded out. Milk records are kept: the quantity of milk yielded by each cow, morning and evening, is noted and added up weekly; and thus it can be readily ascertained what is the milk production of any cow during the twelve months. The figures for 1910 showed yields from three different cows of 922, 915, and 906 gallons, respectively. In 1911 the average yield per cow of the herd of 49 cows was 613 gallons. The animals are fed carefully and systematically.

5101-19.

Record is kept of the quality as well as of the quantity of each cow's milk. Dr. Boeddicker is strongly of opinion that the richness of the milk is a constitutional question with the cow, that the quantity of milk can be influenced by the food, and that within certain limits the quality can be improved by good treatment of the animal. By means of the records it has been shown that when a cow is first transferred from the farm to the dairy herd the percentage of butter fat in the milk is

5126.

low. On the farm she has only grass; in the dairy she is better housed and fed, her general condition improves, and the butter fat rises to a certain standard and is inclined to remain at that standard more or less, independent of any variation of feeding. This accords with the views put forward by other witnesses that town milk is superior in quality to country milk. Dr. Boeddicker is opposed to the popular belief that the cow which gives a large quantity of milk gives poor milk, and that the cow which gives a small quantity gives rich milk. The importance of this view is that it is based on actual records carefully kept; and it may be mentioned that one of the results of keeping milk records is to show that cowkeepers often form erroneous opinions as to which cows are the best milk producers in their herd. We shall, however, deal subsequently with the necessity of keeping milk records as part of scientific dairy farming (see sections 40 and 54).

Recommendation that Urban Authorities be empowered to open Milk Depôts.

(21) In showing what can be done by private and philanthropic enterprise we are not sanguine enough to believe that the problem of milk scarcity in small towns in the winter will be immediately solved on those lines. The cause of the scarcity is that farmers do not for one reason or another carry on winter dairying. We shall have occasion later to refer at length to this most important question (see section 38).

It will be sufficient to say here that failing other means of securing a winter supply of milk, we recommend that the urban or health authorities of such small towns should be empowered by the Local Government Board to open experimentally one or more depôts in the town for the sale of milk at such depôts only at the local retail price, and to contract with one or more farmers for a fixed supply of winter milk for a term of years. At present there exists the anomaly that paupers, lunatics and prisoners are assured of a ration of good-quality milk all the year round, while many persons outside the walls of a workhouse, asylum or prison are unable to procure milk, even though they may have the means with which to purchase it. And further, not only are the establishments referred to able to ensure a constant supply, but they can secure it at a price much below what would be paid by a depôt opened by, say, the Women's National Health Association. The explanation is that an institution invites tenders for contracts for the milk supply for a specified period. A contract having been made, the farmer knows exactly what his liabilities are and makes his arrangements accordingly. If he had the security of a three years' contract he would probably take a lower price than if he were offered only one year's contract, with a doubtful chance of having it renewed for another year. The result of a three years' contract for the Dungarvan Union in place of a yearly contract was to reduce the average price from 9d. to 6½d. a gallon.

A farmer is often willing to produce and sell wholesale where he will not produce if he would have to sell retail and take all the attendant risks and worry of possible short sales, dishonest distributors, bad debts, etc. We think, therefore, that if the urban authorities were empowered to enter into contracts for the supply of winter milk, and to retail it at commercial rates, the difference between the buying and selling price would pay management expenses, and that there would be as much likelihood of a profit as of a loss. In any case, we conceive the possible burden on the rates would be of little account and the advantages would be out of all proportion of the risk. It is not intended that the local authority should enter into competition with private traders, but simply that it should supplement their sales. The power should only be exercised where there was a *bona fide* need, that is to say, where private trading had failed to meet the public requirements. The scheme does not involve rate aid in the sense of the rates subsidising and cheapening the price of milk, but it does give the security of the rates to enable the ratepayers to be put on a footing of equality with inmates of public institutions. Possibly, in practice, it might be found that in certain cases a winter supply could not be contracted for without taking a summer supply also, and if that were the case we see no objection to that being done, provided always that there was no unfair competition between the urban authority depôt and the private trader. But in many districts where there are creameries, the contractors' surplus summer milk could be sent to the creamery, and the effect of the local authority's contract for winter milk would be to act as an incentive to the production of winter milk where none was produced before. From the evidence given by Mr. Anderson, Secretary to the Irish Agricultural Organisation Society, we have reason to believe that the Co-operative creameries at least would not object to receive the summer milk of such producers, notwithstanding that the winter milk was devoted to domestic use.

Mr C. Cameron,
263-9,
Boeddicker, EIST.

Recommendation.

Russell, 5424.

Mrs H. Anderson,
Box, 28492.

Boyle, 26804-5

Russell, 3693-3.
Blacklock,
72003.

E. A. Anderson,
30297.

(22) Before we pass from the question of the milk supply in towns, we must refer to one alleged cause of scarcity, only to dismiss it. It has been stated that the effect of the Dairies Order has been to diminish the supply for domestic use, because the cowkeeper refuses to sell milk rather than to submit to the inspection prescribed by the Order. Whatever may have been the effect on the creameries by converting the creamery supplier into a home-butter maker (and we shall deal with this question in its proper place), we are satisfied that the scarcity attributed to the operation of the Order has been of short duration, against which must be set the permanent and salutary results. We have been assured over and over again that not more than an insignificant few have been driven out of the milk trade in towns in consequence of the provisions of the Order, and that where persons have been thus put out of business it was to the public advantage, because either the premises or the cows were wholly unsuitable for the production of wholesome milk. And even here, though some temporary inconvenience may have been caused, the result has been a permanent improvement, because it has led to the opening of other premises constructed on hygienic principles and has tended to eliminate what in fact was unfair competition with conscientious, high-class vendors.

Mrs. H. Anderson, 21443.
O'Reilly, 23776-84.

Haich, 3190-8.
Hearrow, 7463-3.
W. Cronin, 11285-53.
W. B. Bell, 11453.
Murphy, 20028.
Hayes, 2982.

(23) In the recommendations which we have made regarding the milk supply of towns, large and small, we have not been able to adopt the suggestion that municipalities and urban authorities should undertake dairy farming. We believe that in the first place it would be objected to by the local authorities as a duty not properly appertaining to them; that it would be costly administratively; and that it is unnecessary unless it can be proved that a supply of milk cannot be obtained by any other means.

Russell, 3433-41.
Thomson, 6148-53.
McGrath, 15387-9.

Another suggestion that we have been unable to adopt is that the urban authority should buy milk and sell it at a central dépôt at cost price, and that poor people who could not afford to pay the ordinary price should get it at a reduced charge. We cannot recommend any attempt to cheapen the food of the people by means of subventions from public funds.

McBain, 21324-41

THE RURAL PROBLEM.

(24) A problem of great complexity is to find remedies for the scarcity of milk which exists in the rural districts of the greater part of Ireland. It is in those districts, where one would most naturally expect to find the lack of milk least acute, that it has most been the subject of complaint that milk cannot be procured, more particularly so far as the labouring population is concerned. The causes of scarcity are many and the remedies must consequently be various. In County Meath, where the rich pasture lands are principally devoted to fattening cattle, milk is almost unprocureable, with or without money. Milch cows are believed to be less profitable than fat cattle, and unless a person can keep a cow at his own expense, milk is practically unobtainable. In Counties Antrim and Armagh and part of County Down, the complaint was not so much that milk was not actually procurable as that it might be available in larger quantities if a proper system of selection in breeding milch cows were encouraged by the Department of Agriculture. In the Southern counties, e.g., Cork and Limerick, the allegation made in the North as to the tendency of the Department to encourage the breeding of store cattle to the detriment of milch cattle, was repeated, though with much less insistence. The complaint most frequently made by the rural labourer was that whereas milk is produced in abundance it is not procurable for money, and for this the blame was universally put on the creamery system. In Connemara and portions of County Donegal adjoining the seaboard the reason assigned for the absence of milk was that the land was too poor to support milch cattle; that the Galloway cow, which is notoriously a poor milker, has been largely introduced because it can subsist on scanty pasture and her offspring finds a ready sale to the cattle dealer. From this it will be seen that for one reason or another the scarcity of milk is serious and widespread. We shall refer presently in detail to the causes and remedies, but first it is necessary to speak of the effects of the scarcity on the public health, in order to demonstrate the vital importance of the question.

Father Barry, 21445-50.
Mrs. Callinan, 4135-8.
Gorticos, 10999-100.

Callinan, 22545-6, 22554.
Lyden, 12774-95.

J. B. McDonnell, 22571-5, 22598-265.

Effects of scarcity of Milk on the public health.

(25) The longevity of the Irish peasant class is well known, and longevity in the main implies good health and a strong constitution. The poverty of the Irish

peasant class is perhaps even better known; and it is certain that the long life and physical strength must have been supported on food which was at once nourishing and inexpensive. The diet of the Irish peasant in the past is, indeed, proverbial—potatoes, buttermilk, and porridge. The Very Rev. Robert Barry, Parish Priest of Oldcastle, in County Meath, has told us from his personal experience what was the food of the labouring man some thirty years ago. "This," he says, "would be their dietary scale. They would have breakfast in the field, at 8 o'clock in the morning, of stirabout, more solid than what is now usually called porridge, made from oatmeal. There would be a supply of milk; usually, if not always, buttermilk, and bread made from wholemeal or wheatmeal, sometimes from ryemeal, with no mixture of flour whatever, but made on buttermilk usually. This was served after the stirabout, with a fresh helping of milk. The dinner was served in the field at 1 o'clock, and consisted of potatoes and butter, with buttermilk, followed by a piece of bread, as at breakfast, and a fresh helping of milk. The supper consisted of potatoes and buttermilk, served at the farmhouse; and these men, after a hard day's work in the field, cutting corn with hooks—very laborious work it was—would take the barn-door off the hinges, and there you would see the ideal step dancing going on. I do not say that I would wish those days to be brought back, but the men fed on the diet I have mentioned were hale and healthy and strong, and able to amuse themselves after a hard day's work They had the strength and the heart, and I do not think the present generation would be able to endure the same toil and hardship on that food, or any other." It will be observed what an important part milk and buttermilk formed of the diet; and that neither meat, baker's bread, nor tea was used. Similar testimony was given at Skibbereen, in County Cork, by the Clerk of the Rural District Council, and the Medical Officer of Health. The latter, Dr. O'Meara, who has long taken a deep interest in the question of the milk supply, attributes the longevity of the Irish race largely to the prevalent use of buttermilk up to twenty years ago. "Defective dietary has," he says, "been reducing our national stamina for the past thirty or forty years. Previous to that time, though the population was far greater than it is now, our peasantry, who were robust and little troubled with consumption, lived on bread made from home-grown wheat, skimmed milk, potatoes, and stirabout." Evidence to the same effect could be multiplied, but it is unnecessary to labour the point. The important fact is that the diet of the labouring class has been entirely changed and that to-day the wholesome food of potatoes, oatmeal and milk (including buttermilk and skim milk) has been replaced by baker's bread and tea. To quote again from Father Barry: "The dietary scale of the present day labourer is, as a rule, tea and baker's bread three times a day. Often tea is taken with very little, if any, milk; and bad butter, bought in the shops, is considered a luxury, and perhaps a little foreign bacon The want of milk has so habituated them to the use of tea that they have got out of all economy in the home." Dr. O'Meara also gives the present day diet of the labourer. He says, "Now the peasantry live for the most part on tea, and bread made from imported flour. Milk is not now obtainable by the poor, who, even when ill, have difficulty in obtaining any." Or if we turn to independent sources the evidence is the same. In an official publication of 1908, entitled "Tuberculosis in Ireland," we find the usual diet of the peasants in Erris, County Mayo, is given as follows (pp. 24-25):—

Breakfast—Tea, about one pint, and in the great majority of cases without milk, or at least for several months of the year, with about 1 lb. of sodden bread, baked with water, and sometimes with buttermilk mixed with water.

Dinner—Potatoes, about from 3 to 4 lbs., with an inferior salt fish when they can get it, about 2 lbs. for a family of six or seven, or one quart of milk or some shell fish. The above is their dinner from August to March or April, and from March or April to August they use Indian meal porridge with some milk, when they have it, say, from 1 to 1½ quarts to a family. In the absence of milk, which is usual till the middle of May or June, they use soup made with shell fish, or shake anagar on the porridge and use it, or coffee.

Tea—Same as breakfast, but in smaller quantities.

Supper—Potatoes, etc., same as dinner, but in smaller quantities, or porridge, etc.

Where men are working at a distance from their home they use for breakfast and dinner about one pint of cold tea, with or without milk, and about 1½ lbs. of bread.

Belmullet, County Mayo.—*Breakfast*—Consists of tea without milk, and bread made up of flour and Indian meal. *Dinner*—Generally potatoes and salt herrings. *Supper*—Generally the same as breakfast. Milk is scarcely ever used during the winter months, as the cows dry up for want of proper feeding. When fish cannot be procured, they use eggs with the potatoes for dinner, and during the summer months very often milk also. There are some poor people who use Indian meal stirabout without milk almost all the year round.

Rural District of Galway (Western portion).—Average number of family—six. *Breakfast*—Indian meal, with milk when procurable, bread and tea. *Dinner*—Potatoes for seven months, with fish occasionally. Indian meal for five months, with milk when procurable. *Supper*—Bread and tea. Potatoes when plentiful. As regard milk, it is almost impossible to say the amount used; when the cow is giving milk, it is used by the family, but when dry, tea is used black, even by the children. Cows in the rural portions of West Galway do not rank as very good milkers. An average of, say, 30 quarts of milk a week would be a good allowance; if the whole year was taken, the average would be less, as there are months when there would hardly be a pint a day used.

The conclusions arrived at in this document (p. 31) are the same as those we have already derived from the evidence, viz., that in Ireland "there has been a very great change in the dietary of the people. Fifty years ago, and even up to a later period, the people lived to a great extent upon potatoes, supplemented by oatmeal porridge and milk. Repeated failures of the potato crop have gradually lessened the reliance of the people upon the potato, and, although it is still a large feature of their dietary, it is a diminishing one. For oatmeal porridge, Indian meal was first substituted, and now oatmeal is hardly ever partaken of, and Indian meal rarely, except in the very poor districts in the West of Ireland, the places of porridge, milk, and potatoes being supplied to a large extent by bread and tea—tea with a good deal of sugar, but with little, if any, milk. The consequence of the change is that the more varied dietary of the past with its great saving feature, milk, is supplanted by a more monotonous and less easily assimilated food of bread and strong sweet tea. Although there is a considerable gain in food value from the larger amount of bread used, the loss of the variety secured by the oatmeal, and the serious loss of nourishment incurred through the substitution of tea for milk may possibly account for much of the malnutrition and dyspepsia from which the poorer classes in Ireland suffer."

The common use of tea and bread in place of milk and oatmeal tends to degeneracy, and it is for the welfare of the community that there should be a reversion to the older articles of food. Lest we should be supposed to exaggerate the importance of milk as an article of diet, we will quote the weighty words of Dr. Thompson, Professor of Physiology. Replying to a question whether he had any views as to the effect upon the constitution and character of the race that would be plentifully fed upon milk, Professor Thompson said, "First of all, I think the race really is affected by the ability or inability of the mothers to nurse their children, and this is very largely at bottom a question of the nutrition of the mother. The mothers among the poor people are really not, I think, sufficiently fed to be able to nurse their children, and then I think the whole question of the nutrition of the working man has the greatest influence upon his willingness and capacity as a worker. In fact, I think the lack of interest in his work, what is called by some the laziness of the Irish workman, is largely a question of feeding him. So that the question has an intimate relation with the economic condition of the country."

Prof. Thompson,
1894-7.

Scarcity on the Western Seaboard.

(26) The problem in Connemara and on the western seaboard of Counties Mayo and Donegal is exceptionally difficult to deal with. It has even happened that the milk supply for Clifden hospital has failed. In many places in these districts the land is of the poorest quality; the cows by reason of insufficient or innutritious feeding give at best a poor milk yield—the yield per cow in parts of Co. Donegal was put at from 100 to 150 gallons a year—and the scarcity has been accentuated by the introduction of the Galloway hull. Galloway cattle are popular because they are hardy; they can be kept in the winter without much trouble or expense, and the offspring of these bulls find a ready sale. They are, however, poor milkers, and cross breeding with the Galloway hull has been carried to such an extent that it has seriously affected the milk supply. The holdings are small or of extremely poor

O'Connell, 21770-4.

McNells, 23815.

quality, and at present it is practically impossible for the occupiers to keep more than one cow. We can only hope that the remedy in these congested areas may lie in the development of the work of the Congested Districts Board, viz., the division of the grass lands among the small tenant farmers. At any rate, if the holdings were enlarged the farmers would be able to keep more cows. We cannot say that this result would actually follow, but at least if the scarcity of milk be felt as a grievance the remedy would lie in their own hands. An improvement in the breed of goats might also be helpful in these districts in solving the milk problem.

(27) To the difficulty of obtaining milk or buttermilk has been attributed the disease of oatmeal, the neglect to make home-made bread, and the habit of tea drinking. Of the evil effects of the last named practice it is almost impossible to speak too strongly. Tea, even when properly made, is not nutritious; and unfortunately it is often very badly made. The tea leaves are allowed to stew on the hob and later when more tea is wanted a fresh charge of water is added. In such cases the tea is not an infusion but a decoction, and a dangerous fluid. In dealing with the tea drinking habit we travel in a vicious circle. Speaking generally, tea is, in the first place, drunk where milk is difficult to obtain; then, because tea is preferred to milk, no serious effort is made to procure the latter. Most parents are aware that milk is a necessary food for infants; yet we found not unfrequently that tea without milk is given to babies and young children because milk is not forthcoming. Children of three months' old have been brought up on tea; they get accustomed to the taste of it as a man gets accustomed to the taste of alcohol, and the habit becomes inveterate. Thus the injury is twofold. For want of nourishing food the infant constitution is debilitated; anæmia, scurvy, abscesses and rickets are a natural consequence, the effects of which are life-long; the power to resist sickness is seriously impaired, and the enfeebled child succumbs more easily to the various diseases it may contract. In the second place a craving for tea is induced, which creates a repugnance for milk. Miss Von Stieglitz, Superintendent of the Co. Down Infirmary and Newry Hospital, attributes the great number of cases of tuberculosis in children who come into hospital to the fact not that they have drunk tuberculous milk, but that they have had insufficient milk, and are consequently badly nourished. It may here be put on record that we most emphatically believe that the value of milk as a food far outweighs all other considerations, and that fatal forms of disease are likely to prevail among a community where the children's milk supply is scanty.

(28) Another aspect of this question is the effect of the absence of milk on the health of invalids and sick persons. Medical men have told us that when they have prescribed milk for their patients they were informed that they were prescribing something which could not be got. In such cases milk was practically a medicine, without which the chance of the patient's recovery was considerably reduced.

The need of popular instruction as to the value of milk as a food.

(29) Perhaps the most desirable thing that could be done would be to stimulate the demand by instructing the people as to the food value of milk, and the economy of using it compared with many other foods which are used as substitutes. We have received testimony over and over again from town and country and from all classes of witnesses that milk is not sufficiently appreciated as a food. It is treated as a luxury to be bought when means permit, but not as a prime necessity. We have been told of labourers who would not eat their breakfast without a rasher of bacon, but with whom milk was a negligible quantity. In Belfast, the quantity of milk consumed in the household of skilled tradesmen and artisans would often not exceed a pint daily. Ignorance of the value of milk is a potent cause of the comparatively small demand for it.

It is hard to persuade people that milk is the cheapest and best food. Various suggestions have been made to remedy this state of affairs. One of the most effective would be to teach children the subject of food values in schools; and to ensure competent instruction, we suggest that it be made a subject of examination for teachers in primary schools. In technical schools the value of milk could be referred to in the Cookery classes, and made part of the Domestic Economy instruction given under the authority of the County Council Committee of Agriculture and Technical Instruction. Care Committees in the country acting under the National Health Insurance Act could, when visiting sick members, give advice as to the advantages of using milk, and indirectly this would serve the interests of the Committee.

Gorman, 34123-6.
Nurse Lappin,
24225.
Dillon-Kelly,
24250.
Courtney, 10198.
McCarthy, 34294.
Prof Thompson,
1081.
Fisher Barry,
2128.
Dr. O'Sullivan,
22211-2.
Dr. O'Meara,
24272-3.
J. Barker, 21283-5.
O'Sullivan,
22224, 19226,
19311.
Baincroft, 10364.
Dr. Barry,
22583-4.
Dr. Keane, 11206.
J. M. Barry,
22642-6.
Lady Coghill,
24215.
Miss Von Stieglitz
17986, 12000.
Von Stieglitz,
12002-4, 12006-8.
12027.
O'Sullivan,
24277-80.
Robinson,
22227-8.

Dr. Lee, 12229-5.
Dr. Barry,
23072-5.
Dr. Gordon,
21899.
Dr. Greene,
16032-6.
Dr. M. Burke,
14037-8.

English, 2407-17.

Dr. Webb, 4061.

McDonnell, 6550.
Dr. Baffie, 6550.
Cannwell,
6527-38.
Orrery, 7265.
Father Sheehy,
6524.

Owen, 11581-3.
Mrs. Anderson,
21407-9.

Recommendations.

Particularly it is desirable that young mothers should receive instruction on this point, for, strange as it may seem, many mothers are quite ignorant of the importance of a milk diet for their children. Much good is being done in this direction through the agency of Babies Clubs, inaugurated by the Women's National Health Association and subsequently taken up by the United Irishwomen, and evidence was not wanting that the influence of the teaching imparted at these Clubs is beginning to have visible results; but while much has been accomplished much more remains to be done. Information could also be disseminated by lectures and literature, telling in popular style that milk is something more than a beverage, and by pamphlets showing the dietetic value of milk, which could be distributed by Registrars of Births and others. The question of economy has already been referred to in paragraph 7 of this Report. In recommending the foregoing methods, we desire to avoid any suggestion that all that might have been done in the past has not been done; nor do we suggest that in some cases those methods are not actually in practice; what we recommend is that all the means practicable for the enlightenment of the public on this all-important question should be utilised in as systematic a manner as possible, the reason being that the upbringing of a healthy, vigorous race depends on the proper nourishment of the children.

(30) If a widespread and steady demand for milk existed to such an extent that it would be commercially profitable to cater for it, the supply would be forthcoming. For example, if the poorer people were persuaded to buy in larger quantities, the cost of distribution would be reduced, because it is as easy to serve a quart as half-a-pint. Incidentally, an enlightenment of the public mind on the milk question would react on the conditions under which milk is produced. We must, however, deal with things as they are. At present it is not profitable to meet the small, fitful and unorganised demand of the scattered rural population.

Scarcity in Rural Districts, the Causes and proposed Remedies.

(31) The chief causes of difficulty of obtaining milk by the labouring class in rural districts are the general want of appreciation of the value of milk as a food, the fitful demand for it, the scattered condition of the population, and the lack of organised means of distribution. In the winter months the cause almost universally is the entire absence of milk, because there is no winter dairying. Two other far-reaching causes (both good in themselves) have tended to restrict the rural labourers' milk supply—the passing of the Labourers Acts, whereby the relations formerly subsisting between the farmer and the labourer have been changed; and the introduction of creameries, which have absorbed the milk of the country side.

Effect of the Labourers Acts.

(32) Prior to the passing of the Labourers Acts the farmer and the labourer were interdependent on each other. On the one hand, the labourer received from his employer a house (not always a very good one), a fresh plot of land each year for potatoes, and milk or buttermilk for himself and his family. On the other hand, the labourer made the interests of the farmer his own, and for the success of the farming he worked early and late, frequently for low wages. Now, under the Labourers Acts, the labourer is provided with a cottage and an acre, or half an acre, of land; he sells his services to the farmer (not necessarily to the farmer on whose land his cottage is situated) by the day or week or month, as he pleases, or to the road contractor, whichever he considers meet to his advantage. The labourer is under no obligation to work for the farmer, nor the farmer to employ him, and the identity of interest is gone. There appears to be no desire to bring back the former conditions, but one of the ill-consequences of the labourer's independence of the farmer is that the latter no longer regards it as a moral obligation to supply the occasional labourer with milk, buttermilk or skim milk. The changed relations between farmer and labourer were deplored by those having the interest of agriculture at heart, on the ground that the success of the industry is dependent on mutual goodwill between employer and employee.

CREAMERIES.

(33) Complaint has been made from almost every quarter and by almost every class of witness that creameries are one of the most potent causes of the scarcity of milk for domestic purposes. The loudest and bitterest complaints come from per-

Miss Ven
Boughton, 12000.
12000.
Mrs. Anderson,
21540.
Mrs. Shanks,
23049-51.
Dr. Kennedy,
23147-50.
Munphy, 20691-2.
Mrs. Sherlock,
22006-8.
Mrs. O'Farrell,
24641-5.

O'Meara 14183-6.

Mrs. Allen,
16434-2.

R. A. Anderson,
1006-10.

Kennedy, 4245-54.
J. Ross, 5326.
Gordon, 5382.
Dean, 5987-8.
Coarney,
10190-3.
W. R. Bell,
11990-501.
Boche, 14702-5.

Boche, 14697.

Dr. O'Moses,
14100.

O'Shea, 12991,
12994.

sons living in districts where milk is most plentiful and where creameries are most numerous. A witness from Skibbereen stated that when he came into practice in the district seventeen years ago there were only two creameries in the locality, that now there are 13 creameries, and that the difficulty of obtaining the milk supply among the poor is coincident with, and has developed *pari passu* with the growth of the creamery system. Another witness from Kanturk district explained how the introduction of the creamery system had adversely affected the labourers' opportunities of getting milk. Under the old system the farmer set his milk at home and was not disinclined to give or sell small quantities of sweet milk or buttermilk. Now the farmer who is sending his milk to the creamery will not break bulk. Again, there was formerly a plentiful supply of good skim milk and buttermilk which were used for baking bread. Now, it is complained, poor women cannot get a quart of sour milk and they are dependent more on baker's white bread than on their own wholemeal bread. We quote these statements because they fairly represent the consensus of opinion as to the effect of creameries on the domestic milk supply in rural districts. Home-butter making has practically ceased at farmhouses, and thus the supply of buttermilk, so wholesome and yet so cheap, for labourers has been cut off. Another loss to the rural population by the substitution of the creamery for the farmhouse butter-maker has been the loss of the skim milk supply. There is no comparison between the hand-skimmed milk of the farmhouse of twenty years ago and the separated milk of the present day creamery. In point of cleanliness and taste the home skimmed milk was as good as the new milk, and still retained 10 p.c. of butter fat. The separator of the creamery leaves less than 0.1 p.c. of butter fat, practically a negligible quantity; and owing to its treatment (of which we have already spoken in par. 9) separated milk is often unpalatable within a short time of leaving the creamery. A further disadvantage is that the creamery supply is drawn from many different sources, some of which may be positively bad. We shall refer later on to the evidence we have received regarding the spread of disease by the agency of milk returned from creameries.

(34) We have set out here somewhat fully the various complaints and criticisms of the creamery system which have been brought to our notice because we believe that they represent a large body of opinion in Ireland, and that in consequence a careful study of the creamery system appears to us desirable, in the course of which study we will indicate in what way advantage may be taken of the system and in what points improvements and alterations might be made.

Fundamentally the change that has taken place in the butter making industry in Ireland has been the conversion of what used practically to be a retail trade into a wholesale trade. The old method, universal up to 1880, was that each farmer made butter at home, gradually filling his firkins with layers of butter produced under all sorts of different conditions and continually varying in texture and flavour. These firkins he sold in the nearest market, direct to local customers, or to middlemen who sometimes attempted to obtain an approximately average quality by blending the contents of a number of firkins together and sometimes merely exported the butter without even this attempt to remove the chief commercial objection to butter made in this way, i.e., complete lack of uniformity in flavour, colour, texture or package. Each dairy-farmer under this system was in very much the same commercial situation as, for instance, a hand-loom weaver; and in the old days the Irish butter trade was a very great national asset, just as the hand-woven linens and woollens were.

From about 1880 foreign competition began, first from Denmark then from other countries, and Irish butter began to lose ground, not only in the British, but actually in the Irish market. The prices obtainable for Irish butter produced under the old conditions were so unprofitable that a large number of dairy-farmers went out of the business altogether and resorted to dry stock. The trade appeared to be doomed to destruction. There was only one way to meet the competition from abroad and that was to adopt the methods of our competitors, instal the latest modern machinery, and put upon the market butter of a higher and more uniform quality. Hence the introduction of the creamery system. At first, most of the creameries started were proprietary concerns, i.e., profits earned by the creamery belonged to the individual or company who owned it. But by a fortunate coincidence, the co-operative movement was founded in time to deal with the new situation, and the vast majority of creameries in Ireland are now owned by the dairy-farmers themselves, who retain all the profits earned in their business. In this way the Irish butter trade was saved, and the dairy industry was retained in Ireland.

(35) But if the creamery system has these advantages to its credit, it has brought certain disadvantages in its train. The public attention is drawn to these drawbacks and the system as a whole is often blamed. We believe that these disadvantages can be removed without in any way injuring the creamery system; and, indeed, any proposal which we consider would act detrimentally to that system would, in our opinion, injure the welfare of the entire country. We have already compared the old fashioned home-butter maker to the hand loom weaver. The modern creamery is an exact analogue of the up-to-date power-driven textile factory. The owners (who are, in the case of the co-operative creameries, the farmers themselves) find it commercially more profitable as well as more convenient, to do business in the wholesale fashion. The reasons given for the disinclination of the farmers to sell new milk in small quantities are many, and taken together are such as to make it unlikely that relief may be expected from a change in their views. For example, they object to the vexation of selling in small quantities; to having persons coming about the farmhouse at all hours of the day and interrupting the work of the house; to keeping small accounts and perhaps making bad debts. Small sums received from day to day are less attractive than a lump sum received at longer intervals and more regularly. Hence farmers prefer to discontinue the petty and troublesome retail part of their business. They are not to be blamed for this, any more than the directors of a weaving factory are to be blamed for preferring wholesale methods of selling their produce. Nor can the system be blamed unless we are prepared to condemn the entire commercial system of modern life.

It remains, however, a fact that by the very conditions of the trade as it is now carried on, the labourer or small householder finds it more difficult than formerly to obtain his supply of milk. We do not arrive at this conclusion solely on the grounds of the numerous complaints that have been brought before us in the evidence. We regard it as the inevitable consequence of the change to which we have referred in the manner of conducting the butter trade. The actual evidence itself will be found to be often confusing, and sometimes even contradictory, unless this clue be utilised. For instance, in the milk-producing area north of Dublin, we were told that all the milk goes into the City of Dublin, and a supply for labourers is almost unobtainable. A similar condition, we were told, exists in Essex and many other parts of England, according to Mr W. Robertson Scott. We were told of creamery districts in which there were no complaints of shortage, and of at least one home-butter making district in which the shortage was said to be acute. We were told that the creameries would not sell milk; and we were told that the creameries were never asked to sell it. We heard of farmers, and even of labourers owning a single cow, who preferred to stint their own families rather than diminish the amount of milk sent to the creamery.

3494-3517.

Robertson-Scott,
32450.

(36) A great variety of suggestions have been put before us for remedying this unsatisfactory state of affairs.

(a) It has been often suggested to us that creameries (and even individual farmers) should be required by law to sell milk to all comers. We do not see our way to adopt the suggestion that any cow keeper or any other person producing goods required by the public should be compelled to sell in one way rather than in another, as we consider it would be an unjustifiable restriction on the liberty of the individual to conduct his trade in whatever way he finds advantageous. It is even probable that if any such suggestion were enforced the result would be to drive the cow-keeper out of the business and thus make matters worse than before. We therefore reject the idea of compulsion.

3395.

(b) We pass on to the possibility of obtaining relief by voluntary means. The true solution is to begin by changing the method of purchasing and by setting up a system which shall complement the change in the method of selling. That is to say, we must convert the small, fluctuating and troublesome sale to individual labourers and small householders into a wholesale demand. We require what would correspond to the co-operative societies of consumers in the great cities, which can place their orders advantageously. Such a small society, or, as we propose to call it, "Milk Club," could purchase its requirements at 8d. a gallon, and could distribute the milk to its members at the popular price of 1d. a pint. The difference would pay whatever small expenses were necessary, and if any profits were made they could be periodically divided.

Recommendation.

We think it desirable to elaborate this proposal in detail. In the first place, in nearly every instance, creamery managers have stated to us that they would have no objection to selling milk, and that it could be done without interfering with their business. Some creameries do already sell milk, and in other cases, as we have already noted, where it is not sold, it is alleged that no application has even been made. If the selling of milk by creameries has not been more general, we believe it is because neither the managers, nor the committee, nor local public opinion, realise the necessity for replacing the old and disappearing methods of supplying milk locally by an improved system. In the light of the evidence elicited during our Inquiry it becomes, not a legal, but a very strong moral, obligation upon creamery managements, whether proprietary or co-operative, to establish as a permanent part of their business an adequate scheme for providing a local milk supply. And as we have deliberately rejected methods of compulsion, with their attendant cast-iron rules, danger of friction, ill-will and possible hardship, we trust that the creameries themselves will see the necessity for doing their part in organising a steady demand. If the demand be organised the supply would be an easy matter, and Mr. R. A. Anderson informed us that it would be simple to set aside the milk from the best suppliers for this new branch of the creamery business.

R. A. Anderson,
3033, 3037.

While no hard and fast rules can be suggested, there would, of course, have to be regulations, varying according to local requirements, in order to protect the interest of the creamery, e.g., milk should be sold only for cash or prepaid ticket (see par. 37) and no credit should be given, the hour of sale to be fixed as locally convenient; and the price to be, if possible, the same all the year round. In some cases the creamery might be able to open a retail milk shop of the ordinary city type, either on its own premises or in a neighbouring town or village. But commonly, even in such cases, the organisation of a demand by means of the Milk Club would be an essential part of any really permanent solution of the problem.

(37) The initial step is therefore to organize the demand. This is a piece of social work well adapted to voluntary and philanthropic effort. There would be a good deal of work to do for a short while, a little help and supervision would have to be given for a longer time, until finally the Milk Club system had settled down into a recognised and necessary part of the ordinary life of the country, just as the creamery system itself has done. The organising of the demand means only this: that a sufficient number of small orders be pooled into a single order, which would be large enough to make it commercially possible for the creamery to deal with it. The actual organising could be done by anyone with a little business knowledge, tact, and some spare time; and there are a variety of most useful voluntary agencies lying ready to hand, more especially the Women's National Health Association and the United Irishwomen. We will return later on to other applications of the Milk Club idea, but wherever complaint is made of a shortage of milk within the sphere of operations of a co-operative creamery, we recommend that some public-spirited person in the district should write to the Irish Agricultural Organisation Society headquarters, Plunkett House, Dublin, to enlist their support in approaching the creamery committee. From the outset, the interest and assistance of the committee must be sought in order that they may help to make the creamery arrangements fit in with a practical and permanent scheme. Details will necessarily vary according to local conditions, and we give a few typical alternatives.

Recommendation.

(a) Milk Club, Type 1.—Where a considerable number of labourers live in close proximity to a creamery building, the Club should make a list of the total demand for milk among its members, and arrange with the creamery manager to set aside the amount named every morning. The members could generally call themselves for their share, or, if this proved inconvenient, a boy could be employed for a couple of hours delivering the milk to members.

(b) Milk Club, Type 2.—Where cottages are widely scattered, the person organising the Club will have to induce some local man who owns a spring cart and horse to deliver the milk at a weekly wage. Where the milk can be purchased at 6d. per gallon, and sold at the popular price of 1d. per pint, it has been found (at Fenit, Co. Kerry) that the margin of 2d. per gallon is enough to cover the cost of cartage.

R. A. Anderson,
30319.

(c) *Milk Club, Type 3.*—Where the creamery is in a small town or village, the consumers would include other classes than the agricultural labourer, and in such cases the milk could be sold as in an ordinary milk-shop.

(d) *Milk Club, Type 4.*—Where a co-operative store exists, selling general requirements to the public, it would usually be possible to add the retailing of milk to its other business. But the demand would have to be organized by forming the Milk Club, in order to reduce to a minimum the fluctuations that occur among unorganised individuals, which would sometimes leave the shop manager with a surplus of milk on his hands, and at other times would find him with too little to meet the orders.

In this connection we would very strongly advise that wherever possible the system of purchasing milk by ticket should be adopted. The scheme is as follows:—Books of tickets, or strips of coupons, to be provided by the Club, containing 7, 14, or 21 tickets, each ticket being value for one pint of milk. The book would be sold for cash paid in advance only at 6d., 1s. or 1s. 6d. as the case may be. These books would be purchased each pay-day by the consumer, thereby providing for the whole following week's milk supply for his household. This may seem a small detail, but if the method were adopted the reduction in the trouble of book-keeping would be relatively enormous, the bad debts would be nil, the orders each day would be more regular, and as we have already indicated, each pay-day would insure the whole week's supply. Further, the system helps to prevent petty frauds where milk is delivered by an employee, and it would often be convenient to keep a record of the purchasers, by printing consecutive numbers on the books or strips, and noting the purchaser of each.

Another variant of the scheme would be for the manager to sell as many tickets as the customer might require from an ordinary perforated ticket roll.

As is already done in Naas and elsewhere, charitable societies might purchase such tickets in order to give them to the poor in their charge in lieu of cash.

We would add that this system would often be useful in other branches of the milk trade besides these small clubs, for which we have suggested its adoption.

It will be observed that great stress is laid on the necessity for *organized demand*. We mean by this phrase that members of the proposed Milk Clubs should invariably be admitted on the condition that each is prepared to purchase a definite amount of milk every day. The multiple fluctuating small orders are thus transformed into a single fixed large order, and though on a small scale, it introduces the principle of wholesale selling by the farmer which we have seen is attractive to him in common with the rest of the world's producers.

It is, we understand, not possible to form such small organisations into actual and recognised co-operative societies owing to the obligations—financial and otherwise—imposed by the Act under which co-operative societies proper exist, but we do not see why the spirit of the co-operative system should not be adapted to meet this special problem, and if experience should show that some modification of the Friendly Societies Act would encourage the development and extension of these proposed clubs after their possibility had been proved, it should not be hard to secure such modification.

WINTER DAIRYING.

(38) The alleviation to be expected from the creamery supply would, of course, be partial; it would be obtained only in those districts in which creameries exist, and would probably extend only to within a short radius of the creamery. The difficulty of making the creamery a general distributing centre is the distance of the would-be purchaser from this source of supply.

Cowman, 15141, 3.
Coffee, 10780.
J. N. Burke,
12028.
De Berr, 17033.

Since the scarcity is almost universal and most acute in winter, a practical remedy for nine-tenths of the suffering complained of would be found if farmers could be induced to take up winter dairying. It is not too much to say that the national health and the national prosperity would be immensely improved in consequence. Taking the less important considerations first, the material advantage that would accrue, we found that for lack of winter milk the majority of creameries either closed down or worked short time during the winter months, say from November to March; that during that period they either lose touch with their better customers or maintain it with difficulty; and that every spring they have to

Recommendation.

Wibberley,
18884-5,
Balfour, 20375,
R. A. Anderson,
9905.

Casswell, 9347

undersell their foreign competitors to regain their trade, or, to use the expressive phrase of one witness, they have to bribe their way into the market. Such methods, we were told, are a source of loss, worry and uncertainty; and that unless winter dairying is seriously taken up by the Irish farmer, Irish creamery butter will eventually lose its hold on the market. As an indication of the loss that follows on the failure of the farmer to supply even his home markets, it was mentioned that one importer in Belfast buys £5,000 worth of Danish butter in a month, and altogether it is estimated that £25,000 worth of Danish butter is brought into Belfast during the six winter months. To a greater or less extent the same thing is happening all over the country. The other consideration in favour of winter dairying is the public health. We need not dwell on the inconvenience to adults who are not able to obtain milk in winter; it is serious undoubtedly, but it is not fatal. What is of importance is the health of children and infants, of sick persons and invalids. Tea for infants is poisonous, and yet almost everywhere tea is given to infants as a substitute for milk, because milk cannot be obtained in the winter.

M. Fitzgerald,
17591-66

Lough, 4472,
Morrison, 13826-9,
Keane, 16515,
16521,
M. Fitzgerald,
17046-9.

Gordon, 5993-21.

(39) For the farmer the question of winter dairying is a matter of business, not sentiment; for the State it is one which concerns the national health and public weal. Therefore, to the former it must be proved that winter dairying can be made to pay as a commercial proposition, while to the latter it must be shown that the subject is of sufficient importance to warrant such action being taken as will induce farmers to undertake it. At present the farmer declares that winter dairying cannot be made to pay; that owing to the price of feeding stuffs and the scarcity of labour the receipts from butter-making or the price paid by creameries is unremunerative; that people are unwilling to pay a remunerative price for retail milk, and that there is less profit on winter milk at 3d. a quart than on summer milk at 2d. a quart. The chief deterrents, however, seem to be the alleged difficulty of obtaining suitable labour, and a belief, based rather on tradition than on actual experience of suitable modern methods, that winter dairying cannot be made to pay.

It has been demonstrated by actual experiments carried out by the Department of Agriculture in Counties Cork, Down and Tyrone that a cow which calves in November will yield milk for a longer time and give a greater quantity during the period of lactation than a cow which calves in the spring, and that even under the present system of farming the winter-calving cow is, taking the milk alone, without having regard to the consequential benefits, a more profitable animal than the cow calving in the spring. The matter is of such importance that we reproduce in brief the evidence given by Mr. Gordon, Chief Agricultural Inspector to the Department of Agriculture, on this point:—

Experiments on winter milk production were carried out in County Cork in the years 1907-8 under the auspices of the Agricultural Committee and the Department. Two centres were selected, and 20 cows in all were tested. Ten of these cows calved in November, and ten in March and April. The November calvers gave an average yield of 802 gallons and the spring calvers a yield of 680 gallons, a difference of 122 gallons per head in favour of those that calved in November. Taking the value of the milk at 5½d. per gallon, the winter calvers gave a return of £2 16s. 0d. each more than the others. The increase of milk from the November calved cows was attributable to the effect of the grass stimulating the flow of milk when the cows were turned out in May, and as a result these animals milked much longer than those that calved in spring. While it is not suggested that all dairy cows should be managed so as to calve in October, November or December, it could be so arranged that a much larger proportion of the total number of cows in Ireland calved in the autumn or early winter: the yield of milk would be greater and it would be advantageous to the whole dairy industry of the country. Experiments were also conducted in County Down on two farms during the years 1907-8-9; and in County Tyrone one experiment of a similar character was carried out in the years 1910-11. Another series was carried out at Clonsilla Agricultural Station during the period 1906-9; and the Department are at present carrying out an experiment in winter dairying at Ballyhaise Agricultural Station. The results of the experiments show clearly that winter dairying will pay when cows give an average yield of 650 gallons of milk.

The financial results are fully set out in Mr. Gordon's evidence (Volume I. pp. 182-3); shortly, they show that on one farm in County Cork the plus difference in the net profit per winter calving cow was £2 10s. 1d.; on another farm in County Cork it was £1 4s. 1d. per cow; on a farm in County Down it was £2 0s. 10d. per

cow; while in County Tyrone the experiments showed this result—that on each of the five winter calvers there was a net profit of £3 4s. 0d., whereas on each of the five spring calvers there was a net loss of 5s. 9d. The experiments were made with cows selected for appearance, of similar type, size and value; and the calculations as to receipts were based on average creamery prices. Two important facts were established by these experiments. In the first place it was shown that a cow can be induced to yield from 80 to 100 gallons more milk when she calves in November instead of in April. In the second place it was shown that November calvers leave a higher profit than those born during the spring months. The winter calvers are stronger and hardier; and if the condition of the calves and the cost of keeping the cow when dry are taken into consideration the results would be decidedly in favour of winter dairying.

(40) In recommending winter dairying we premise the existence of two essentials: (1) that tillage is carried on, and (2) that cows kept are of good milk-yielding capacity. If for the moment we put aside the question of catch-crops, tillage is essential for winter dairying. Incidentally it provides work for a larger population; and, by the cultivation of the land, conditions which favour the spread of disease among cattle are removed. At present there is in some districts scarcity of labour, and if farmers wish to go back to tillage they might for a time find it hard to do so. Thus the failure to cultivate the land and the scarcity of labour interact, and disease among cattle is favoured by neglect of the land.

The second point is that for winter dairying to be profitable, the cow must give a milk yield of not less than 600 gallons during the period of lactation. It is notorious that this quantity is well above the average yield in Ireland. In County Cork we were told that the average milk yield per cow does not exceed 450 gallons; in County Clare it was put at 500 gallons; in County Limerick at 440 gallons. These are results obtained by haphazard breeding. In the herd of Lord Rosse, where milk records are kept and the dairy cows are carefully selected, the average yearly yield per cow for the last two recorded years is well over 610 gallons, and several cows gave from 700 to over 900 gallons. Sir Richard Barter has also by selection and elimination raised the average milk yield per cow in his herd from 540 to 700 gallons. It will be seen, therefore, that while successful winter dairying depends on an average yield of at least 600 gallons per cow, it is possible to reach the standard by the adoption of proved reliable methods, and we refer hereafter at length to the necessity of dairy farmers keeping milk records as a condition of profitable cow-keeping, and to the valuable work begun by the cow-testing associations established by the Department of Agriculture and Technical Instruction.

Catch-Crops.

(41) Another factor which tends to make winter dairying profitable is the practice of growing catch-crops, *e.g.*, rape, vetches, rye, and hardy greens. For the last few years the Department's Agricultural Instructors, particularly in Counties Limerick, Cork and Kerry, have been teaching by theory in winter classes, and by practice on demonstration plots the advantages of catch-cropping. The advantages claimed for this system of agriculture are that the tillage is simple and can be done quickly; that the cost of cultivation is reduced to a minimum; that the ordinary risks incidental to the growing of root crops are avoided; that the land can be utilised the whole year round, instead of lying idle for about six months of the year, and that with catch-cropping less concentrated food is required, and the catch-crops can be so combined as to give in winter a ration much the same composition as June grass. What crop shall be sown, and when, are matters which depend on local conditions, and no hard-and-fast rules can be laid down.

Ensilage.

(42) The ensiling of fodder crops is a most valuable aid to winter dairying. We have received evidence that silage can be given to dairy cows without tainting the milk, the only precaution necessary being that it must not be brought into the byre until the milk has been removed. There are two kinds of silage, sweet and sour. Both forms are wholesome for all cattle, but in the case of milch cows sweet silage is generally preferred. It is not necessary to have a built silo. Silage can

Mason, 742, 822.
Roche, 16772-3.
R. A. Anderson,
666-9.

Garroll, 12340-7.
P. J. Howard,
16102.
Cusack, 17337.
Bordoberry,
5105-19.

Barter, 14980-7.

Whitby, 18872-3.
Appendix A, Vol.
2, p. 324.

be made in a stack, although there may be some loss where the sides and top are not carefully covered with earth. There is, however, no capital outlay required in buildings, and the position of the stack can be changed. Special fodder crops, such as vetches and rye, etc., produce great weight of fodder when ensiled, and can be made to take the place of root crops when labour is scarce.

The development of winter dairying is, as we have set out in sections 39, 40 and 41, chiefly dependent on the extension of tillage, on a system of catch-cropping, and on the improvement of the milk yielding properties of dairy herds. We consider that these subjects are of vital importance, and we strongly recommend that increased attention be given to their encouragement and development throughout the country.

MILK SUPPLY IN NON-DAIRYING DISTRICTS.

(43). We pass on to the section of our problem, which is perhaps the most difficult of all, i.e., those areas in Ireland where, for one reason or another, the dairy industries are practically extinct. It is also in these areas that the ill effects of scarcity are probably most marked.

We have dealt with the urban portion of these areas in sections 17 and 18. It remains to devise some possible remedies for the rural portion.

Most of the suggestions made to us by witnesses may be summarised in the word "Subsidy." We are unable to recommend any form of rate or State-subsidised milk supply. We have come to this conclusion, not merely from the belief which we have expressed in the inherent evils of a food supply artificially cheapened out of public money, but also after careful consideration of a variety of ways in which it has been suggested that the urban or rural local authorities might give financial assistance to the retailing of milk in certain districts. Apart from the theoretical objections, these schemes invariably seem to us to break down when examined as possible measures for the relief of this kind of distress.

(44) We turn, therefore, to other alternatives. The first is suggested by the Milk Club scheme, already described in connection with the creameries. There is nothing to prevent the establishment of similar small organisations in areas, rural or urban, outside the creamery districts. The chief difference (and sometimes it would be a serious one) is that the Milk Club would generally have to draw its supply from individual farmers, and not from a society. This rules out, in most cases, the possibility of inducing the cow-keeper to sell milk to all comers, since it is precisely the petty worries and the small difficulties of carrying on this kind of trade, that have almost killed it, even where milk is produced on a large scale; the suggestion is therefore not likely to lead to a successful solution of the difficulty in places where milk is hardly produced at all. But if a demand were once organised, many a farmer keeping a few cows, whether for his own use or for rearing calves, might be persuaded to try the experiment of supplying a fixed amount, say five gallons a day to a single order; that is to the person employed by the Milk Club, to call at his farm, at a fixed hour, for the whole consignment. The work of organising this demand, and perhaps especially of inducing the farmer to try the experiment, would be distinctly more difficult than in the creamery areas, but it would be well worth trying, even though in every case it might not ultimately lead to success. Where the farmers proved obdurate, and assuming that a railway service were available, an attempt could be made to import the milk by rail from some milk-producing district. In these, as in the previous cases, the work of setting up these Milk Clubs would probably be best done by some voluntary organisation, since, if successful, they would soon settle down into permanent institutions, and the volunteers would be no longer necessary. We are of opinion that the only way in which Government money could profitably be employed in connection with these Clubs would be in promoting them, where no other agency seemed able or willing to make the effort, and in such cases the services of the Department of Agriculture might be called upon.

Proposed Division of the Land.

(45). Throughout the whole of the Midland belt of Ireland, 30 miles North and South of a line drawn from Dublin to Clifden, the land is practically devoted to raising and fattening cattle, and there is little or no dairying. The reason, speaking

generally, is that in the Eastern half of the belt the land is said to be too rich, and can more profitably be used for fattening store cattle, while in the Western half the land is too poor, and can only be used for breeding and raising young stock. Throughout this area there is a scarcity of milk more or less at all times of the year among the labouring population, but especially during the winter months; and as there is so little summer dairying, it is hardly likely that winter dairying will be attempted on a large scale, even if the inducements we have previously recommended were offered. Two different solutions, both relating to land, were suggested. In the West, *e.g.*, Connemara, it was proposed that the existing big estates be divided among the small tenants, who would, it was contended, then be enabled to keep on their enlarged holdings one or more milk cows, and thus be provided with an all-the-year supply of milk for their families. Possibly the result anticipated would be realised, possibly not—it is problematical. Certainly, on the division of the big estates by the Congested Districts Board, no restriction could be imposed on the allottees, requiring them as a condition precedent to vesting the land in them that they shall undertake to keep milk cows and supply milk to those of their neighbours who were without facilities for keeping a cow. So far as experience goes, it rather shows that in those districts where small farmers abound, owning from 4 to 20 acres, and having from one to four cows, as in County Mayo, King's County and County Kerry, the scarcity of milk in winter exists there as elsewhere. One notable instance of unfulfilled expectations following the adoption of the very plan now under consideration was brought specially to our notice. Representations were made to the Vice-President of the Department of Agriculture by residents in Athenry that there was a scarcity of milk and vegetables, attributed largely to the fact that the grass lands adjoining the town were not in the hands of small resident holders. It was implied that if the land was divided the scarcity of the commodities named would cease. The land was divided in 1908, and four years afterwards we were told that as a result of 52 persons getting plots of land, only two extra cows had been kept; that so far as the increase of the milk supply to the labouring population was concerned, the distribution had been absolutely useless; and that actually less milk is now produced in the immediate locality around Athenry consequent on the division of the lands, because cows which were formerly kept by shopkeepers on fields taken on the eleven months' system have since been given up. Whatever reasons there may be for a policy of transferring the land from the large owner to the occupying tenant, we are not prepared to say that the probability of relieving thereby the scarcity of milk in winter is one of them. And in any case, the adoption of this proposal would leave the needs of the labourer unrelieved.

J. Burke, 21060,
21060, 21723-69.
Gordon, 23861-67,
21008-99.
Joyce, 21996-97.
Deane, 22919.

Barnell, 2421-9,
2421-3.
Holland, 21044,
21049, 21090.
O'Reilly, 21175-6,
21188-2.
21141.

The Conspiret

(46) The other solution connected with the sale of land was that which was expounded by a witness from the Eastern portion of the Midland belt, and which commended itself to us most favourably: it was that the powers possessed by the Estates Commissioners and the Congested Districts Board to reserve on the sale of an estate, under limitations, a plot for the grazing in common of labourers' cows should be liberally exercised. One reason given for the scarcity of milk among the rural population in the fertile county of Meath is that, whereas formerly labourers had no difficulty in obtaining grazing for their cows, the price now charged for grazing a cow between May and November is from £3 to £6 10s. 0d., and that even at this price the grazing is given as a compliment. The cost of keeping the cow during the winter is another £5, so that it means that the labourer cannot keep a cow under £10 a year, and thus to a poor man, when the risks attendant on the keeping of a cow are considered, is practically prohibitive. Under Section 4 of the Land Act of 1903 and Section 18 of the Land Act of 1909, the Estates Commissioners and Congested Districts Board may vest in (a) private individuals approved by them; (b) the Department of Agriculture, County and Rural District Councils, acting as trustees, a portion of the untenanted lands comprised within an estate which has been sold to the Estates Commissioners or Congested Districts Board for resale, for the purpose, *inter alia*, of pasturage, and such trustees hold the land subject to a scheme for the use thereof. One such scheme has been drawn up in respect of a plot reserved at Oldcastle for the grazing in common of labourers' cows, and the aims and anticipated accomplishments of the scheme are fully set forth in the evidence of Father Barry, Parish Priest of Oldcastle, who is one of the trustees. The plot consists of 18

Mrs. Cullinan,
4139, 4152-73.
Father Barry,
2151, 2264.

Deane, 23881-2.

Father Barry,
2183-2234, 2240
34, 2309-36.

acres; 2 acres are allowed for each cow, so that it is expected the needs of nine families will be provided for. The rent charged is about 30s. a year per cow; it covers the cost of the annuity payable by the trustees to the Estates Commissioners and the poor rates. If advisable, a small charge will also be made for fencing, fertilisers and insurance of the cows. The men selected are in every case occupants of a labourer's cottage, having an acre of land on which a certain proportion of the food of the cow can be grown. As the tenancy of each labourer is a yearly one, the trustees retain ample control over the plot, and they can ensure among other things that it shall be used solely for the purposes for which it was intended—namely, the supplying of milk for the district. Thus the following conditions can be guaranteed:—the punctual payment of the rent, the keeping of milch cows, the use of the milk for domestic purposes in the district, and such other conditions as the trustees may think desirable, as, for example, the erection of proper hyres.

Recommendation.

In our opinion the reservation of such plots whenever possible is most desirable. It can be made the means of ensuring in a manner not always otherwise practicable a supply of milk for the household use of the locality. For instance, suppose that by careful selection in breeding the milk yield of cows is increased, or that by the stimulus of financial reward an increased production of winter milk is secured; there is no guarantee that that additional supply will go to the householder rather than to the creamery. But where the labourer is allowed to graze his cow on a commonage such as we are now speaking of, it can be made a condition of his tenancy by the trustees that the milk of his cow shall be first for the use of his family, and afterwards, if there is a surplus, for the use of his neighbours. We are satisfied from the evidence of the witness representing the Estates Commissioners that the policy of reserving a "cow-plot" whenever practicable will at all times receive their sympathetic consideration; and we feel sure that it will receive equal consideration from the Congested Districts Board.

Districts, 32860,
32943.

Districts, 22390,
22399.

Unfortunately, at present, the cow-plot as a means of relieving the scarcity of milk can only be secured when an estate which is sold to the Estates Commissioners or to the Congested Districts Board for resale contains untenanted land—and this class constitutes only one-eighth of the sales. The other seven-eighths are sales made direct by landlords to tenants, through the intermediary of the Estates Commissioners, and the Commissioners have no power to acquire any portion of any tenant's holding to provide a cow-plot. We strongly recommend that every possible encouragement should be given to the extension of this cow-plot system under the present regulations, and that no opportunity for providing one should be overlooked; and further, in view of the forthcoming land legislation, we recommend that increased powers should be given to the Estates Commissioners for the provision of cow-plots where they are able to negotiate for the same during the process of transferring an estate directly from landlord to tenant.

Recommendation.

There is, of course, nothing to prevent any public-spirited landowner doing for his locality what has been done by Father Barry by means of the Land Acts, and we hope the prominence we have given to the subject will induce some of our more leisured and affluent citizens to take up the matter.

Labourers and Co-operative Grazing.

(47) On the other hand, it might seem at first sight as if a group of labourers might themselves combine to take a field for the common grazing of cows enough to supply their requirements. There are, however, almost insuperable difficulties. Apart from the question (by no means an easy one) of getting a number of such labourers to agree upon the details of a scheme, and of securing a committee from among their number that are capable of working it, and of undertaking the necessary financial and other responsibilities, there is a still more formidable obstacle. The full competition rent of the field would have to be paid by any such group of men, and since this may run to as much as three times the bare commercial value of the grazing, the contribution of each labourer would have to be unduly large; while the mere fact that the tenure of the land would obviously be uncertain would alone deter any group of labourers from risking their money in the purchase of cows.

But it is so obviously desirable that some means should be devised to enable these men to provide their own requirements in some such way, wherever they are enterprising enough to desire to do so, that we recommend the insertion of clauses in the forthcoming Land Bill to provide new statutory powers for local authorities in order to make it possible to establish the following scheme.

Recommendation.

Hire of field by Rural District Council for grazing of labourers' cows.

(48) Where the conditions are suitable (*e.g.*, where the cottages are fairly close together in sufficient number and reasonably accessible to each other), and where there is a scarcity of milk not remediable by some of the alternatives which we have already suggested, the Rural District Council should be empowered to apply to the County Council to purchase a field centrally situated among the group of cottages, and to lease the grazing of the field to *bona-fide* labourers resident within the Rural District Council's jurisdiction upon condition that milch cows only should be grazed upon it, and that the surplus milk (if any) should be sold locally. The rent per cow should be fixed by the County Council, and the Rural District Council should be responsible for collecting it and remitting it to the County Council. The County Council should be empowered to recover from the District Council all losses incurred in working the scheme. It should also be empowered to cancel all arrangements made with any person discovered to be not entitled to the grazing. The County Council should be given power to become the purchasing tenant within the meaning of the Land Acts.

Recommendation.

If the field chosen should prove to be too small to accommodate all the *bona-fide* applicants, the Rural District Council should be permitted to ask the County Council to purchase additional acreage. If, on the contrary, the field should be too large, the County Council should be empowered to part with any or all of the area to the highest bidder in public auction. Obviously, the scheme as outlined so far, only deals with the supply of milk in the summer. But even in summer it would hardly work satisfactorily unless it included the organisation of "Milk Clubs" among the occupants of the field and their neighbours. It is perfectly clear to us that in the absence of such "Milk Clubs" superfluity in one household does not necessarily help to remove the scarcity in a neighbouring household. If, however, Milk Clubs of the kind mentioned were established among the persons using the common field which we are here recommending, we believe that a comparatively small extension of the "Club" system would secure the purchase by its members of milk from other districts where winter milk could be procured, even if it should prove impossible to obtain it locally. We think that this is one of the many ways in which voluntary and philanthropic effort could be very profitably utilised; for, once established, it would be possible to maintain this system of "Club" purchase of milk even from outside sources with a minimum of expense, so long as the necessity had been recognised among members of the "Club," and some public-spirited person of any social grade were available to act as "Chairman" of the "Club."

We are of opinion that this scheme would get over the very objectionable situation which has occurred in Croom, where the trustees for what was intended to be a cow-plot were actually compelled to graze stock upon it themselves to meet the annuity, because no application had been made for grazing. It must not, however, be supposed from this instance that cow-plots are a failure. The reason why no application was made for the grazing was, that labourers could obtain a sufficient supply of milk from local farmers, and had therefore no need to keep a cow.

CITFORD, 18875-2,
18883, 18942.

Proposed provision of Land and a Cow for Labourers.

(49) A variety of suggestions were submitted to us regarding the possibility of relieving the scarcity of milk in certain districts by providing the labourer with a cow. We refer to these only to dismiss them as impracticable. In County Limerick the proposal took the form of a prize to be given to the best cultivated labourers' plot—the prize to be a cow! That is to say, the labourer having been persuaded to cultivate his acre properly is to be rewarded with a cow, for whose benefit he would have to lay out his plot again in grass. In County Cork a prize scheme was also

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suggested, which, by depleting existing premium and other funds, would provide about 40 cows per annum. Since there are some 3,000 to 4,000 labourers eligible to compete for such a scheme, it will be seen that the proposal, even if otherwise desirable and practicable, would not do much to improve matters within a reasonable space of time. Of all the suggestions that have been put forward, the most reactionary was to add one, two, or even four more acres to the labourer's plot. We regard this as a thoroughly retrogressive and machievous scheme, since it would tend directly to create that very condition of congestion (a multitude of small un-economic holdings) which it has been the aim of Irish legislation during the last thirty years to abolish. We feel satisfied that the solution of the problem before us is not to be found on any of these lines.

There are, however, many cases (either under existing conditions, or, if some of our recommendations be enforced), where a thrifty labourer would get grazing for a cow if he had the means of purchasing one. We think the proper way of enabling such a man to obtain a loan for this particular purpose is the development of the Raiffeisen type of co-operative or agricultural credit bank, which lends on personal security, and which has special means of ascertaining the applicant's character, circumstances, agricultural knowledge, and all the other factors which must decide the suitability of such a man for obtaining a loan, involving a certain risk which it is impossible for a State department to take with safety. We have, however, not thought it necessary to make inquiry as to the whole question of rural credit and small loans, as there is a Departmental Commission at present conducting such an inquiry.

Goats—*"The Poor Man's Cow."*

(56) To meet the need of people living remote from communities and in widely scattered cottages, and who do not keep cows, the only source of milk supply appears to be the goat, sometimes called the poor man's cow. The objections that are usually urged against that animal where the population is aggregated, viz., that it has predatory propensities and is of destructive habits, would not apply in the remote and mountainous districts. In point of nutrition goat's milk compares favourably with cow's milk and is extremely valuable as a food for infants. When we recommend the keeping of goats we do not refer to the common Irish goat, which gives milk for from three to five months in the summer, when cow's milk is plentiful, and breeds only at one season, but to the new and improved breeds, such as the Swiss Toggenburg and the Anglo-Nubian. These goats can by judicious management be made to yield milk for a much longer period during the winter season. The breed likely to give the best results for Ireland is the Swiss Toggenburg. An average supply of 2 quarts a day per goat may be expected while the animal is in milk; though in the Ards, where the influence of Lady Dunleath's goat breeding has been greatest, 2 quarts a day is not considered very good; and in a case where records were kept by a man owning two Anglo-Nubian goats, the yield was 3 quarts a day for five months, and 2 quarts afterwards for two or three months. The free importation of foreign goats is, however, prohibited; and until the Department of Agriculture in England can see its way to allow animals to come in under strict quarantine at the port of debarkation, reliance must be placed on the strains now in the country. Much might be done by crossing the Irish goat with the Swiss goat: there would probably be an extension of the milking period of the resulting female progeny as compared with the Irish goat; and because foreign goats are much softer, requiring constant care and hand feeding, than the Irish goat, which is hardy, the constitution of the offspring would probably be improved. At the same time a great deal could be done to improve the native goat, by selecting and registering the best milking animals and breeding from them, carefully preserving their female progeny, and mating these with a male from a good milking strain. Many Irish goats are good milkers, some of them giving up to 3 quarts of milk a day for several months. It is not our province to go into the question of source of supply, price, or means of feeding goats of the improved breed, or of the housing, treatment and tethering of goats generally: much that is useful on these points will be found in the evidence. Information can also be obtained on these points from the Secretary to the Irish Goat Society, Ely House, Dublin. But we desire to give publicity to the goat scheme of the Irish Goat Society. It is as follows:—

1. A society to be formed of persons interested in goats, with the object of stimulating interest amongst goat breeders and in improving the breed of goats.

1946, 4248-50,
4571, 5013,
5075-80,
5527-32, 10091-2,
11295.

Footnote, p. 84,
Volume I.

Lady Dunleath,
1900.

Hutch, 3344.

Ards, 1899-4.

Hutch, 3434-6,
Robertson-Scott,
32463-9.

Townson, 2360-1.

Recommendation.

J. W. Robertson-
Scott, 32448-52.

Gordon, 5234.

2. Local associations to be established in rural districts where goats are kept; these to be organised chiefly through the Women's National Health Association.

3. The Department of Agriculture to purchase male goats of the best breeds and sell them at a reduced price to the Irish Goat Society for resale to selected applicants, who will take proper care of them, mate them with native goats, and keep a record of the progeny.

4. To encourage classes for goats at local shows, where such are held, and to establish goat shows in districts where there are no agricultural shows. The County Committees to assist by means of a small grant.

5. The local associations to arrange for the registration of goats by means of local inspections, for the adjudication at shows, the keeping of records, etc.

It has been found that where prizes have been given at local shows they have had a very great effect in stimulating interest in the question. The Irish Goat Society's scheme has anticipated our recommendation that Government aid be given for the encouragement of goat shows and goat exhibitors at agricultural shows. We would moreover recommend that stress be laid on the possession of milking strain rather than on breed.

Lady Dunsath,
1895,
W. R. Bell,
11505-8,
Robertson Scott,
32453-42,
Lady Dunsath,
1066.

CATTLE DISEASE.

(51) Another reason accounting for a shortage of milk which has been brought before us must be mentioned, viz., the prevalence of cattle diseases, such as contagious abortion, the mortality among calves from white scour, etc. In certain counties, principally in the South, the loss due to the above-mentioned causes is enormous. These are evils which can only be combatted by the assistance of the veterinary surgeon; but it is certainly disquieting to find these diseases extensively prevalent during so many years, and we can only hope that farmers will realise that they are essentially preventable.

EFFECT OF THE DAIRIES ORDER.

(52) As stated in par. 22, we have found that the effect of the operation of the Dairies Order in restricting the sale of milk in towns is practically negligible, but it appears that in the country a number of persons who were formerly willing to sell surplus milk to their neighbours have now ceased to do so in order to avoid inspection of their cows and byres. But while a number of isolated cases have been mentioned to us, perhaps the best index of the general result is given in the reports made by the medical inspectors to the Local Government Board. Of the Galway district, Sir Acheson McCullagh said, "There is not the slightest reason to think that the operation of the Dairies Order has had the effect of driving people out of the dairying trade. No such instance has occurred in my district. The curious thing is that where the Order is in force the people are trying to improve the cowsheds and to comply as far as possible with the requirements of the inspector. Of course, there are some exceptions, but there cannot be the slightest doubt that the Order has been beneficial and is slowly effecting an improvement in the milk trade. *The Order has in no way curtailed the milk supply to the public.*"

13832-22, 22042-4,
25539-4,
Smith, 30 47.

Dr. Browne, the Inspector for the Dublin district, speaking of the southern portion of his district, said that he had heard cases where farmers gave up supplying milk to labourers, but could not give particulars; otherwise he knew of no restrictive effect of the Dairies Order on the milk industry. Dr. McCormack, who is in charge of the Cork district, stated, "I do not know of a single case in which the carrying out of the provisions of the Dairies Order has had the effect of driving people out of the dairying trade. Some of the cowkeepers, no doubt, threatened to give up the keeping of cows altogether when they found that everything tending to the production of a pure and healthy milk supply would be strictly carried out by the

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officers appointed under the Order, but they never did so. It is now generally admitted that the Dairies, Cowsheds and Milkshops Order, if properly and efficiently administered, is one of the most useful and effective of all the many beneficent acts comprised in the wide field of preventive medicine at the present time. That is the opinion expressed to me by the several officers of health, numbering about 80, with whom I discussed the question of the administration of the Order on the occasion of my inspection visits through the south-western districts since February last."

Dr. O'Brien, who is in charge of the Belfast district, wrote, "I can give you very little information in support of the suggestion that the enforcement of the Dairies Order in my district has caused any shortness of the milk supply for domestic purposes. I have only heard this suggested as being so in one district, namely, the Newtownards Rural District. This difficulty of obtaining milk was, I understood, experienced by the labourers in certain parts of the Ards portion of the Union. I have also heard, and I believe it is a fact, that the enforcement of the Dairies Order has caused a diminution of the milk supply to one or two creameries in the Ballymena Rural District, Ahoghill creamery and its depot, and the Rathkenny creamery. The price paid at the former creamery was low and may account for the falling off of the supply." The reports of a number of medical officers of health in Counties Antrim, Armagh and Down, subsequently submitted, confirmed the statement that only in the Newtownards Rural District had farmers refused to sell milk to labourers for fear of coming under the Order. No statement was forthcoming from the Medical Inspector of the north-western district, as he was absent from duty on account of ill-health. The result may fairly be summarised that whereas no doubt individual cases of privation do exist as a consequence of the operation of the Dairies Order, there has been no general or serious restriction. On the other hand, there has been a general improvement in the conditions under which the entire milk supply is produced. If our recommendation in section 66 be adopted even this partial grievance will be removed.

ALLEGED DETERIORATION OF THE MILK YIELD.

(53) The opinion of many witnesses was that the milk yielding qualities of Irish cows have deteriorated within recent years.

In the absence of records it cannot be proved whether there has been a deterioration or not. In fact, the only positive evidence, based on figures kept at the Agricultural College at Glasnevin, would show that the milking properties of Irish cows have improved rather than deteriorated. But whatever change has taken place, there is no doubt that the average milk yield per dairy cow can be greatly increased by the adoption of suitable methods, and the Department of Agriculture has framed a scheme to that end which only requires the co-operation of the County Committees of Agriculture and of dairy farmers to be successfully carried into effect. The scheme is as follows.—Owners of pure-bred shorthorn dairy cows are invited to apply to the Department for the inspection of animals which they consider suitable for entry. The Department has these animals inspected for general merit (appearance). The owners then keep a record of the yield of milk of those animals provisionally selected. If at the end of the milking period the yield of milk from each animal is 600 gallons or upwards, containing 35 per cent. of butter fat, the animal is duly registered. The Department during each season inspects the cows several times, has the milk weighed, sees that the records are kept properly, and takes samples of milk to be tested for butter-fat. The owner of each registered cow must have the animal mated with a pure-bred bull of her own type, passed by the Department as suitable for a premium. The female progeny from these registered cows are eligible for entry in the register after inspection, and are entered only when their milk record is up to the standard required. But the Department do not confine their attentions solely to pure-bred cattle. They are desirous of encouraging the owners of good non-pedigree cattle to keep milk records and have such animals as come up to a certain standard entered in a register. Owing to the much larger number of animals to be dealt with, the procedure in the selection of cows for the register differs from that adopted in the

Case, 3443.

Gordon, 3470.

case of pure-bred cattle, the work being done through cow-testing associations. Groups of farmers are invited to join an association for the purpose of keeping milk records, the Department giving technical advice, supplying record books, inspection and a small grant towards the expense of testing the quality of the milk. At the close of each season such cows as have come up to a standard of at least 600 gallons and 35 per cent. butter fat are inspected and those of good conformation and likely to breed high class dairy cattle when mated with a pure-bred or registered bull are selected for the register. The bull calves from these cows when a year old are also inspected, and those up to a good standard are eligible for a premium of £10. Formerly bulls so bred were not eligible for a premium. Heifer calves from selected cows are also inspected with a view to registration after they have produced a calf and yielded in one season a sufficient quantity of milk of good quality.

MILK RECORDS.

(54) One of the most essential methods of improving the milking qualities of cows is to keep milk records. It has been the experience of those who have kept milk records that their judgment as to the relative value of their cows as milkers has been falsified when the yield of each cow, recorded week by week, has been totalled up at the end of the year. The advantage of keeping records is that it enables the cowkeeper to weed out the poor milkers and thereby to raise the average milk yield of his cows. It is stated that the estimated average yearly yield per cow is only 460 gallons. For County Roscommon, the average yield per cow was put at 300 gallons. In the dairying Counties of Cork and Limerick it was put at 450 and 440 gallons, respectively. It follows therefore that there must be very many cows in our dairy herds which are not worth their keep and which are merely "pensioners on the farm." By keeping each cow's record the farmer ascertains those which are worth retaining. As to what has been done, we refer to the evidence of Sir Richard Barter, of St. Anne's, Co. Cork, who has kept milk records for thirty years and has by their means raised the average milk yield per cow in his herd from 540 to 700 gallons. In Lord Rosse's herd at Birr milk records are kept and the average yield per cow is over 600 gallons. Lady Coghill, of County Cork, stated that when she first commenced to keep a record the cows were giving about 400 gallons; now the quantity is 600 gallons, and still further improvement is expected. This result was consequent on the information obtained by the keeping of the records, which enabled the owner to weed out the inferior animals and was not due to any change in the breed.

An instance of the absolute necessity of keeping records was mentioned in Limerick. In the one herd it was ascertained by means of the record that the produce of one cow realised £19 1s 5d at the creamery, whereas that of another cow realised only £7 7s 4d. As a further indication of the value of keeping records of the quality as well as of the quantity of milk, it was mentioned that two cows gave 6,340 lbs. and 6,380 lbs. of milk, respectively; but the one which gave the smaller quantity produced value for £12 8s. 6d. against value for £10 17s. 6d. for the other, by reason of the greater percentage of butter-fat contained in the milk.

Why then, it may be asked, does not the farmer keep milk records? It is because he believes his ordinary observation is sufficiently reliable to enable him to form a correct judgment as to which cows are the best milkers, and so long as the total output of the herd pays he is satisfied that his opinion is accurate. When it is suggested to him that he should keep a record he expects compensation for his trouble. It may be here stated that trouble rather than expense is involved in the keeping of records, and, as a matter of fact, it would pay the farmer to keep them for his own information for the reasons we have already stated.

COW-TESTING ASSOCIATIONS.

(55) The best method of extending the system of keeping milk records is by means of cow-testing associations. Several such associations are already in existence, and we anticipate a rapid development of the system throughout the country when farmers become familiar with the advantages to be derived from an accurate

Recommendations.

Puck-Wilson,
3097, 2399,
Wibberley, 18342.
Barter, 14991-4.
Carroll, 12357.

Gordon, 5470.

Perry, 26681.
Carroll, 12346-7.
Cusack, 17137.
Gibson, 17163.
W. R. Bell, 11692.

Harker, 14980-7,
1090-3.

Boodisher, 4104-9.
Lady Coghill,
14224-0, 14234-8.

Wibberley, 18418.

Duggan, 12069-71.

Carroll, 12228.

knowledge of the produce of their cows. In the absence of organised effort, cow-testing associations are difficult to start, and hence the best prospect of success lies in working through the Department of Agriculture and co-operative societies. Thus, in the creamery centres, the suppliers of a creamery can form themselves into an Association. In non-creamery districts Associations might be formed under the auspices of the local Agricultural Society. The Newry Agricultural Society, for instance, proposed to form in connection with the Section for Dairy Cows in the Newry Show a number of milk-testing stations, where records may be checked by a local officer and re-checked by the Department's Inspector.

(56) We will cite another instance of benefits directly due to cow-testing associations. At a creamery in Cavan, where there was an association, a farmer told one of our witnesses that in making up his returns for the previous year he had found that one cow had given him milk to the value of £12 and another to the value of only £5. The farmer said that but for the testing association he would not have known which was the more profitable cow.

W. R. Bell,
11,961-5, 11,960-72,
11,979.

E. A. Anderson,
1924.

PART II—PURITY OF THE MILK SUPPLY.

CONTAMINATION OF MILK.

(57) Milk is liable to contamination in all the stages of its production and distribution, and even in the homes of the consumer. For instance, it may be drawn from a diseased cow; it is liable to faecal contamination in the farmyard or by contact with the dirty clothes or hands of the milker, it may be drawn into cans washed with impure water, or not washed at all. Then in transit, it is exposed to the heat of the sun's rays and to the entrance of dust from the road or the railway platform; in the railway van it may be stowed near unsavoury articles. Under the lid of the tankard there may be a filthy cloth or newspaper, and a brass measuring strip in the can may harbour dirt. In the milkshop there are further possibilities of contamination if the receptacles be not constantly covered, as, for example, from flies. In huxters' shops it is liable to receive a taint or odour from articles such as paraffin oil, vegetables, etc., as well as pollution from the dirt of the shop; or it may be that the vessels containing the milk are not clean. Sometimes the shops themselves and their surroundings are wholly unsuitable. During distribution further opportunities of contamination occur. It may be that the milk is sold by the vendor in the street under circumstances which render it impossible to prevent dust getting into the milk. Dishonest servants may tamper with the milk as by adding water from a polluted stream or ditch. Cases of infection have occurred through contact of the milk with a typhoid carrier, or with persons who were in the family or employment of a dairyman suffering from infectious disease. Finally milk is liable to contamination in the home of the consumer in several of the ways already enumerated, e.g., by flies, by the use of dirty jugs, by proximity to articles in the larder which give a taint to milk. Sometimes the larder is near the ashpit.

We mention these possibilities to give force to the recommendations we shall make to ensure the production and handling of milk in as cleanly a manner as is compatible with commercial requirements. It may at once be said that much of the contamination is avoidable by ordinary care, and it is to the observance of reasonable precautions that our suggestions are directed.

TUBERCULOSIS IN CATTLE.

(58) Obviously it is of the first importance that wholesome milk must be drawn from healthy cows. Milk from a tuberculous cow may not be dangerous, but milk drawn from a cow with a tuberculous udder is almost certain to contain the germs of the disease. Tuberculous cows may be roughly divided into three classes: (1) the cow with a tuberculous udder; (2) the cow whose udder is normal, but which is clinically tuberculous; and (3) the cow whose udder is normal and which is apparently healthy. Of the first class any cow recognized to be suffering from tuberculosis of the udder should at once be slaughtered, as provided by section

19 of the Tuberculosis Prevention (I) Act, 1908, and by the Tuberculosis (I) Order of 1913. Of cows of the second class, some by their emaciated state are easily detected. Under the Order of 1913 such animals may, on the report of a Veterinary Inspector, be compulsorily slaughtered, and pending investigations their milk must be kept separate and be holed or otherwise sterilised. It is to the interest of the owner to get rid of such cows at once, both as unremunerative in themselves and a source of infection to healthy stock. In the third class are the cows which have no tuberculous lesions of the udder and which are healthy in appearance, but react to tuberculin. They may or may not give tuberculous milk, but they are at all times a possible source of danger. Even if at the moment they do not give tuberculous milk, they may do so at any time without warning, and the only reliable way of ascertaining whether the milk of such cows is free from infection is to subject it periodically to bacteriological examination. Another consideration is that though the milk of a reacting cow may be free from infection, her faeces may contain tubercle bacilli, and if the excreta adhere to the cow's quarters and be not wiped off with a damp cloth or otherwise removed prior to milking, the bacilli may pass with manure into the milk. It is a matter of importance to the cowkeeper that in the earlier stages of tuberculosis the flesh of an animal may nearly always be used with safety as human food. The more generalised the disease becomes, the less likelihood there is of the carcass being fit for the butcher. It should be emphasised that the clinically tuberculous cow is a source of danger to the whole herd, for tuberculosis is infectious amongst cows as amongst human beings. The point needs to be brought home to the cow-keeper, and he will then realise that it is to his own interest, no less than to that of the public, that tuberculosis in cattle shall be eradicated.

The Tuberculin Test.

(59) The presence of tuberculosis in cattle can be discovered by the use of tuberculin. Doubts have been thrown on the reliability of the test by several witnesses. Its reliability has, however, been too well established by careful observers to be open to question. This statement does not reflect on the *bona fides* of the witnesses who have expressed a contrary opinion, but perhaps the following facts connected with the test will explain, if they do not remove, existing misapprehensions. In the first place, the extent of the reaction to the test is not an indication of the extent of the disease; often the reaction is most violent when the lesion is small. The *post mortem* on an animal which has been slaughtered because it has reacted sometimes fails to show the presence of tuberculosis until a most minute examination has been made. Possibly in such a case the reaction has been extreme; the owner looks then for extensive lesions and is surprised to find they are apparently trivial.

The conditions under which the test is made is a matter of importance. To be successful it must be made by a professional man, and we recommend that in no case should tuberculin be applied except by a veterinary surgeon. An animal should not be tested immediately after a journey. The cows should be in a normal state of health; she should not be tested if in an advanced state of pregnancy, or if from any cause her temperature is above normal.

Cases have occurred where for fraudulent purposes attempts have been made to prevent diagnosis by tuberculin. Some years ago it was noticed that a number of cattle which passed the French frontier without reacting after the application of the test were found subsequently at the abattoir to be infected with tuberculosis. A certain interval should elapse before the second test be made. The explanation came later; these animals had been injected with tuberculin a short time before, and at the official test there was no result, or only doubtful reaction.

Another important fact is that sometimes visibly tuberculous cows do not react, but in such cases the disease can usually be detected without the aid of the test. It has been the testimony of witnesses having a wide experience that the test is reliable, and that it is the best means for detecting tuberculosis in cattle.

(60) The question of eliminating tuberculosis among cattle is one of great importance to the dairying industry, both directly by the reduction of risk to the public health and indirectly by removing a subtle source of worry and expense to the farmer. The problem bristles with difficulties, but the first and much the most important

Deligdisse, 31773-6,
31790-80L.
McWenney, 529,
London, 5591.

McWenney, 529.
Lambert, 2940.
McConnell, 11943.

Malcolm, 33004-14.
Preston, 36300.

Deligdisse, 31776,
31792-3.
Recommendation.

1299.

J. A. Thompson,
7945-7.
S. Baffio, 8138-95.
J. M. Berry, 8902.
Deligdisse, 31774.
Preston, 32555.

step towards its solution has been taken by the promulgation of the Tuberculosis Order of 1913. The findings of the Royal Commission on Tuberculosis (Human and Bovine) of 1901 as to the transmissibility of tuberculosis from cattle to man must now be taken as proved, and public opinion is fully prepared for definite action towards the reduction of this danger. Statistics regarding the incidence of the disease amongst cattle are unfortunately almost entirely lacking in Ireland, and we could only obtain more or less intelligent guesses at the figure even from the most experienced witnesses. It is clear that whatever course be ultimately taken as regards cows reacting to the tuberculin test, and not otherwise discoverably tuberculous, the first step to take, and to take at once, is to eliminate all cows that can be shown to be tuberculous without having recourse to the test. The law empowers local authorities to order compulsory slaughter of cows suffering from tuberculosis of the udder and tuberculosis with emaciation, and provides for the payment of compensation. With regard to the question of compensation under the Tuberculosis Order, 1913, the Order will probably not effect its purpose rapidly and satisfactorily unless it is to the interest of the cowkeeper to notify the authorities at the earliest possible moment that he has reason to suspect any of his animals. The number of the animals affected by this Order is possibly not very great, and unless the farmers can be induced to play their part, many of such cows would escape detection by the inspector, often for many months. We would suggest that for a specified period of twelve months, when any farmer has voluntarily notified a suspicious cow, he should be compensated if she proved to be tuberculous, under clause 8 (2) on the same scale as under clause 8 (1). It will not suffice to prohibit the sale of milk from such cows; when discovered they should be slaughtered without delay, and we believe that by the exercise of the powers conferred by the Order of 1913 the chief source of infection of the milk supply will be removed.

(61) Thus far we have dealt with cows recognisably tuberculous. There remains the much larger and more difficult question of the reacting animal which shows no sign, other than the reaction, of being infected. We do not know what percentage of Irish dairy cows would react; we have no figures showing what proportion of such cows produce tuberculous milk, nor what percentage of them ultimately develop advanced stages of the disease; no evidence appears to exist showing how many of such reacting cows may ultimately cease to react. There is thus practically no material by which we can form any estimate of the risk to the public health which is incurred through the use of milk from such reacting, but not otherwise discoverably tuberculous, cows: it becomes still more difficult to appreciate the amount of danger that may be involved when we compare the percentage of reacting bovines with the figures published from time to time regarding the percentage of human beings who are found to react to a similar test or who are found to be, or to have been, tuberculous on *post mortem*. In the absence of clear evidence on vitally important questions of this kind, and having regard to the enormous expense that would be incurred in applying any of the far-reaching methods that have been suggested for eliminating all reacting cows, we cannot advise that legislation should be introduced to deal in any drastic way with a problem of which the essential factors are still unknown. At the same time we think every encouragement should be given to persons or public bodies who might be willing to experiment. For example, there can be little doubt that the disease could be eradicated if it were possible to adopt Bang's method in its entirety, and much good would be done by a partial adoption of it. Briefly the method is to apply the tuberculin test to every cow in a herd, to separate the non-reactors from the reactors, i.e., the healthy from the diseased animals, and to isolate the latter as completely as possible. There is no objection to breed from reactors, unless they are in an advanced stage of the disease, provided the calf does not remain with its dam and is not given her milk until it has been boiled or otherwise sterilised. Finally, the reacting cows are fattened and sent to the butcher. To complete the procedure, the non-reactors should again be tuberculin tested six months after the first testing, and if any react they should be separated and treated as previously described. Additions to the herd should, of course, also be tested, but where practicable the best means of ensuring freedom from tuberculosis in a herd is to breed from non-tuberculous stock and keep the calves from contact with infected animals. One great advantage of this system is that by getting rid of tuberculous cows gradually it does not cause a milk famine and send up the price of the milk which remains available. The difficulty in Ireland is that few farmers are in a position to separate their herds

into two rigidly isolated sections. But suppose, for example, some enterprising individual decides to try the Bang system, he is in danger of being required to sterilise the milk from the reacting section before he can offer it for human consumption, though so long as he refrains from testing his herd no restriction is placed on the sale of the milk. If he could have the milk of the non-reacting section certified as from tubercle-free cows, he might secure an enhanced price for it and thus be repaid the cost of his extra precautions; but at present the chief advantage the farmer can hope to derive from his enterprise is the freedom of his stock from tuberculosis. As an inducement to those who might be anxious to co-operate, we recommend that the Department should provide the necessary assistance, as well as the tuberculin required.

Recommendation.

(62) As it is an important part of the Bang method that reacting cows should be fattened and sent to the butcher, it is necessary to reassure the public that the flesh of a tuberculous cow is not necessarily unfit for human food. Most frequently the lesions are in the lungs and glands, which do not form parts of the carcass offered for human consumption, and the carcass proper, i.e., the flesh, is not affected at all. Expert evidence and the findings of the Royal Commission on Tuberculosis of 1898 are clear that no injury to the public health is likely to arise from the use of flesh of reacting cows so long as they pass the ordinary meat inspection at the abattoir. Hitherto there has been no legal definition of what constitutes generalised tuberculosis sufficient to justify the seizure of a carcass. This objection has now been removed by the Tuberculosis Order of 1913, which, following the recommendations of the Commission of 1898, defines advanced tuberculosis as follows (clause 8):—

See Charles Cresson, 219, McWorrey, 216 7, 960-70, Webster, 1473-81, 1481-7.

- (a) When there is miliary tuberculosis of both lungs;
- (b) When tuberculous lesions are present on the pleura and peritoneum;
- (c) When tuberculous lesions are present in the muscular system, or in the lymphatic glands embedded in or between the muscles; or
- (d) When the carcass is emaciated and tuberculous lesions are present.

In the past the advocacy by the Department of Agriculture of the disposal of tuberculous cows in the manner above suggested has met with strong opposition, and in deference to public opinion the proposals were dropped, not because of their un wisdom, but as a matter of expediency. We desire to strengthen the hands of the Department in the matter; their suggestions offer a wise and economical means of extirpating tuberculosis among cattle, and they have the merit that while they do not diminish the available food supplies they considerably reduce the cost of getting rid of the disease.

INSPECTION OF MEAT.

(63) It follows that an important factor in this question is the efficient inspection of meat. Some of the larger towns have public abattoirs and the inspection at these houses is such as to ensure that no carcass or part of a carcass which is unfit for human food will be offered for sale. Side by side with the abattoirs there exist private licensed slaughter houses, and though there are restricted opportunities for inspection by the Corporation officials of the animals killed therein, our information does not enable us to state that sufficient care is exercised to prevent unsound meat being placed on the market. In the smaller towns and in the rural districts it is not usual to obtain a licence for a slaughter house, and there is nothing to prevent animals being driven to an unlicensed house outside the city boundary, there to be killed, and the carcass being brought back into the city for sale. There is no obligation on butchers to kill their beasts in the public abattoir or in a licensed slaughter house, and it is to be feared that those who have most reason to dread inspection resort to those places where inspection is least likely to be adequately exercised. The danger, therefore, is that if, acting on our recommendation, tuberculous animals were to be slaughtered in large numbers as a means of getting rid of tuberculosis among cattle, the suspected animals would be taken to an unlicensed slaughter house and thence disposed of without adequate inspection. We consider it necessary to couple with the suggestion contained in the preceding section a recommendation that stricter regulations be made requiring all animals to be killed either in a public abattoir, or at least in a licensed slaughter house.

Recommendation.

THE DAIRIES, COWSHEDS, AND MILKSHOPS ORDER.

(64) Much of the contamination that takes place before the milk reaches the consumer can be prevented by a strict enforcement of the Dairies, Cowsheds, and Milkshops Order of 1908. We found that where the Order has been strictly enforced a great improvement has already taken place in the milk supply, and its universal application and administration would secure the same satisfactory results. This Order applies to all vendors of whole milk. Its general purpose is to secure (a) the inspection of the cattle of purveyors of milk, (b) the housing of dairymen's cows in sanitary conditions, (c) the cleanliness of milk shops, stores and vessels, and (d) the observance of precautions for protecting milk against infection or contamination. The Order imposes two specific obligations, viz., (1) on every cowkeeper and purveyor of milk to be registered as such by the local authority; (2) on the local authority to appoint as many inspectors as may, in the opinion of the Local Government Board, be necessary for the enforcement of the Order. By a subsequent General Order made by the Local Government Board in 1909, local authorities may be required to appoint a qualified Veterinary Surgeon as Veterinary Inspector for the discharge of certain specific duties. Briefly it may be said that the strict enforcement of these Orders would secure (except so far as a deliberate attempt on the part of the cowkeeper or dairyman to evade inspections was successful) the following:—

- (1) The discovery of dairy cows having tuberculous udders;
- (2) The housing of cows in properly lighted, drained, and ventilated byres;
- (3) The cleansing of the byres at least once daily;
- (4) The cleaning of the udders and flanks of cows before being milked;
- (5) Cleanliness on the part of the milkers as regards their hands and clothes when milking cows;
- (6) The provision of a clean water supply for watering dairy cattle and the cleansing of milking utensils;
- (7) The cleanliness of milk stores or shops, and milk vessels;
- (8) The prevention of contamination of milk by forbidding it to be kept in any living room, or where it will be exposed to impure air or contact with any person suffering from infectious disease;
- (9) The notification by a purveyor of milk of the existence of infectious or contagious disease on his premises or amongst persons employed in his business, and the cessation of the sale of milk by him until the medical officer of health shall have declared the premises or persons to be free from infection.

It will thus be seen that local authorities are empowered to prevent all, or nearly all, the contamination that takes place in the farmyard and much that occurs in milkshops. Unfortunately, the Orders are inoperative in part or in whole in many districts, because of the laxity of the local authority, and we refer hereafter to the means to be adopted to ensure a systematic and uniform administration of the Orders.

LICENSING VERSUS REGISTRATION OF COWKEEPERS AND MILK VENDORS.

(65) As we have mentioned, cowkeepers and milk vendors are required under the Order to apply to the local authority for registration, the object being to bring these persons under the observation of the District Council by means of its inspectors. The local authority has no power to refuse registration on the ground that the applicant's premises are unsuitable, and if there is any failure to comply with the provisions of the Order the remedy of the Council is in the last resort to prosecute the offender. The magistrates then may take a lenient view of the case and by the imposition of small fines may make the Order of little or no effect. This procedure seems to us to be cumbersome, uncertain, and possibly ineffective. We recommend therefore that all milk vendors in County Boroughs and urban districts

be licensed (a) personally, (b) in respect of their premises, and that every cowkeeper in those areas be registered. If a person be a cowkeeper as well as a milk dealer he would require to be registered in the former capacity and licensed in the latter capacity. Persons selling milk from a cart but having no premises in the town would also require a licence to sell. We recommend that the licence be given by the Public Health Authority of the district in which the vendor plies his trade, that it be renewable yearly either free of charge or at a nominal fee, not exceeding one shilling, and should be revocable under specified conditions. For example, the licence should be withheld or cancelled in case of prolonged or serious infringements of local requirements under the Food and Drugs Act or of the Dairies Order. In this way it would be possible to deal with a man who persistently sold dirty milk or milk produced under conditions that were unsatisfactory though not of such a nature to make it practicable to proceed against him by the ordinary process of law, or whose milk was consistently of poor quality and who refused to give facilities for the taking of samples of the milk of his herd at the time of milking.

Outside the County Boroughs and Urban Districts both milk vendors and cowkeepers should continue to be registered in accordance with the provisions of the Dairies Order, which should be strictly enforced. When the occupant of a labourer's cottage has signified to the District Council his intention of keeping a cow, we should be glad if the Council could see its way to provide him with suitable cow-byre accommodation and charge a small rent for it.

Definition of milk to include by-products of milk

(66) Another recommendation we make apropos the Dairies Order is that for the purposes of the Order the definition of milk be made to include its by-products which are used for food, such as buttermilk, skim milk, separated milk, butter and cheese. As the Order stands it applies only to the vendors of whole milk, whether they sell it wholesale or retail, to shops or to creameries. We have learned in evidence that a number of milk producers have given up the sale of milk to avoid coming within the terms of the Order, and thus escape liability to have their cows and byres inspected by the local veterinary and dairy inspectors. It is in this way that complaints have arisen that the effect of the Dairies Order in rural districts has been to restrict the supply of milk for those who formerly obtained the surplus milk of persons keeping, say, one or two cows for private use. Creamery managers have also complained that the Order has adversely affected their business by inducing a number of their former suppliers to become home-butter makers. The presumption is that if a farmer becomes a home-butter maker to avoid the inspection of his cows and cowsheds, he is badly in need of it, and we consider it imperative that he should come within the terms of the Order. We recommend therefore that the Dairies Order be made to apply to all milk producers, including the person who keeps only one cow for the use of his family. By these means the local inspectors would be able to discover all diseased cows, and the complaints of private consumers and creamery managers that the Dairies Order has restricted their milk supply would be removed.

Recommendation

Clark, 8786-2.
McDonnell, 10728.
Casson, 11738.

SMALL LOANS FOR IMPROVEMENTS

(67) We believe that sometimes the local authority has hesitated to require strict compliance with the Dairies Order as regards cowsheds and milkshops because the occupiers were unable to afford the cost of the necessary alterations. Such, for instance, is the case in Waterford. It would be much easier for the Veterinary or Dairy Inspector to insist on structural improvements if it were possible for the occupier to obtain small loans for that purpose at moderate rates of interest. At present loans are made by the Board of Works for the erection and the improvement of cowsheds, subject to a minimum of £35 to tenants and £50 to owners. Often a very much smaller amount would be sufficient, and we hope the Departmental Committee now inquiring into agricultural credit will devise means whereby such loans will be available.

Huguen, 24903-4.

Re INCREASING THE VALUATION ON IMPROVEMENTS.

(68) Our attention has also been called to the effect of increasing the poor law valuation on the erection of new farm buildings or the improvement of existing ones. It has been represented to us that the dread of increased taxation has deterred a

Gordon, 3333.
Porter, 9448-9.

Recommendation.

great many tenant-farmers from improving their premises, especially in districts where the rates are high. In Railway Bills the land through which the projected railway is to run is exempted from increased valuation for a number of years, and we think that a similar exemption should be given to farmers—that is to say, that no increased valuation be placed on their outhouses until, say, 5 years after erection or improvement, thus enabling them to reap some benefit from their outlay before having to pay the increased taxation.

FINES AND PENALTIES IMPOSED FOR BREACHES OF THE DAIRIES ORDER.

(69) It has been a subject of complaint from many persons living in various parts of the country that inadequate fines are imposed for offences connected with the production and vending of milk. We refer at present to prosecutions where convictions have been obtained for breaches of the Dairies and Cowsheds Order. The requirements represent the minimum of what is necessary for the cleanly and hygienic production of milk, viz., that a cow shall be housed in a properly lighted and ventilated byre, having sufficient cubic air space; that it shall have an impervious floor, and a channel for drainage; that the milker shall have clean hands when milking, and that a supply of water, soap, and a towel must be provided. Obviously if milk is contaminated at its source no subsequent precautions in handling it can get rid of the original impurity. We are satisfied from abundant evidence on the subject that even those local authorities which are strictest in enforcing the Order do not prosecute for breaches thereof without giving the parties concerned every reasonable opportunity of complying with its requirements, and the danger is rather in a too lax than in a too rigid enforcement. It is therefore a matter of the gravest regret that when a prosecution has been instituted and a conviction obtained for a breach of the Order, magistrates should treat the offence as venial and impose only a nominal fine. The effect is twofold—it discourages the local inspector, and encourages the offender, and, worse still, other parties also culpable who have not been proceeded against. The effect may be illustrated by two cases brought under our notice in two districts not very far apart. In the Newry No. 2 Rural District the Council had reason to complain of the condition of the byres of a considerable number of cowkeepers who supplied milk to the local creamery. They were allowed two summers in which to bring the byres up to the standard required by the Order. No disposition having been shown by the cowkeepers to make the necessary improvements, the Council instituted proceedings against 84 persons, and fines were imposed. As the prosecutions did not have the desired effect in all cases, five persons were prosecuted a second time and substantial fines were imposed. The result was wholly satisfactory, not merely in the five cases referred to, but also in the other cases not taken up. The necessity of drastic action in this instance was that if contaminated milk was received at the creamery from only a few suppliers the whole supply would be contaminated; this contaminated milk would, after separation, be returned to farmers who had taken all reasonable precautions to ensure a clean and wholesome supply, and possibly a countryside would pay the penalty in an outbreak of infectious disease, solely through the criminal negligence of a comparatively few suppliers who refused to bring their byres up to the minimum standard of cleanliness. We mention this example first with pleasure because it shows that there are magistrates who are prepared to assist the local authority in enforcing the Order, and because it illustrates the beneficial results attendant on the imposition of adequate penalties for breaches of the Order.

There are, however, unfortunately, instances in the opposite direction. The Veterinary Inspector of the Belfast and Castlereagh Rural Districts, Mr. McClure Barry, mentioned that frequently fines of 1s. or 2s. and costs have been imposed on conviction. His striking comment on this was that not only was the punishment not deterrent, but it was inviting the offender to repeat the offence. He showed that it would actually pay a cowkeeper to risk detection and pay an occasional fine of 20s., because he could recompense himself by saving the wages of an employee who would otherwise be required to tend the cows properly. A case was mentioned to us in England of a man who had twice had tuberculous cows in his herd pointed out to him by the Veterinary Inspector and who was finally prosecuted for having a cow with advanced tuberculosis of the udder. The fine imposed on conviction was 5s. The suggestion that occurs to us is that magistrates fail to realise the gravity of the offence and the inevitable effect of their adjudication. Magistrates should

Fawcett, 2701-4.

W. R. Bell,
13448-51.J. M. Barry,
8862-71.Dr. Cameron,
31108-4.Watson, 1202-3,
1494-6, 1275-6.
E. Barry,
33327.

realise that though breaches of the Dairies Order may seem trivial they are really serious. It is no exaggeration to say that life and health are ultimately involved in maintaining the standard of cleanliness required under the Order.

FINES FOR ADULTERATION OF MILK.

(70) Apropos the subject of fines in prosecutions relating to milk, we turn to another class of evidence dealing with complaints that adequate fines are not imposed on convictions for the adulteration of milk. On this subject we cannot speak too strongly. Compared with the preceding subject of carelessness in the handling of milk, the offence is in every way more serious. Of the former it may be said that it is due to ignorance, the financial inability to provide hyge accommodation, to stupid carelessness; in fact, that the offence is passive not active, criminal only in effect and not in intent. But the adulteration of milk is a deliberate act, due to greed, and usually without palliating circumstances. The adulteration of milk is more serious than the adulteration of other foods, because in certain cases milk is the food of children and invalids, for which no adequate substitute can be found. Again, the adulteration of milk is a fraud practised most frequently on the poorest section of the population; so that it is both one of the meanest forms of theft and a felonious act, and calls for the severest punishment on conviction. We are aware that the treatment of this question is not free from difficulty and we will briefly refer to the points to show that our remarks are not made without due consideration thereof.

M. Shale, 8512
Barnett, 50085

The legal standard of pure milk

(71) The legal minimum for pure milk fixed by the Department of Agriculture requires that milk shall contain not less than 3 per cent. of fatty solids and 8.5 of am-fatty solids, or a total of 11.5 of solids. For various reasons the percentage of butter fat in milk as drawn from the cow is liable to variation. For instance, if cows are milked at unequal periods, say (as is usually the case in or near towns), at 5 a.m. and 2 p.m., the morning's milk will contain a smaller percentage of fatty solids than the evening's milk. It may also happen that a cow which gives an abundant quantity will give milk of a poor quality, but this must not be taken as a fixed rule, nor may the converse be taken as true, that a cow giving a small quantity will give rich milk. Another fact to be borne in mind is that though occasionally genuine milk may be deficient in butter fat, it is unusual for the non-fatty solids to vary to any great extent. Another important fact is that whereas the milk of a single cow sometimes falls below the legal minimum as regards butter fat, the milk of a herd will at least reach the 3 per cent. limit. Ordinarily the minimum limit is well exceeded; in Belfast it was stated that milk produced within the city often contains 4 per cent. of butter fat. It is also possible that milk may be deficient in butter fat because the strippings have not been carefully drawn, or have been milked into a separate vessel. The distinction is that in the first case the act is negligent, in the second case it is fraudulent.

Mr C. Cameron,
277.

Cocconuz,
16186.
Coxton, 282.7.

M. Shale,
8487-44.

Mr C. Cameron,
1106.

Mr C. Cameron,
1895.7.

D. J. O'Holroy,
12814.

Reynolds, 6630
Thompson, 8049.

Crowell,
6319-4.

Agnew, 8505.
Reynolds, 6925.

As the law stands a prosecution for adulteration cannot be sustained if the vendor can prove that the milk complained of is as it came from the cow. The legal minimum of 3 per cent. fixed by the Department of Agriculture is admittedly low, but was fixed as the standard of the poorest pure milk likely to be produced. Ordinarily the percentage of butter fat in the milk of a herd is well above 3 per cent., and the minimum limit makes full allowance for a reduction which at times may be caused by abnormal conditions. If, therefore, magistrates accept a lower limit than 3 per cent. they give a latitude in addition to that which has already been given by the Department of Agriculture, a practice which is strongly to be deprecated.

Quinton, 43635.

Mr C. Cameron,
222.

(72) The witness representing the Lurgan Urban District Council spoke strongly of the discouraging effect of the failure of magistrates to convict in cases where the butter fat was below the legal minimum. In one case the percentage was as low as 2.56; in another case it was 2.74, and the defendant had previously been prosecuted. Both cases were dismissed on the ground that the milk was as it came from the cow, notwithstanding that in the latter instance there were serious reasons for suspecting

Pollock, 8026-74.

Reynolds, 7542
H. W. Balfie, 8296.
Balfie, 8298.

Balfie, 8302.
Reynolds, 6937.

Reynolds,
6937-01.

Recommendation.
Reynolds,
6938-41.
Balfie, 8402.

Russell, 8479.

Recommendations.

Young, 3624-32,
8606-41.

Young, 3624-61.
Recommendations.

En C. Cameron,
734-6,
Glegg, 7350-1.
Recommendation.

Recommendation.

En C. Cameron,
779-61.

the innocence of the vendor. In Belfast it was stated that difficulty was experienced in getting magistrates to convict unless the butter fat was 25 per cent. or under, and that not only were prosecutions discouraged if the percentage exceeded 25, but that the Corporation officers had been reprimanded for bringing such cases against respectable dealers. As a consequence the Public Health Authority had adopted the policy of prosecuting a dealer only when his milk was found for a second time to be under 26 per cent., because it was feared that if it became widely known that prosecutions would fail if the fats were 26 and upwards the general standard of milk would be lowered. It was alleged that a number of cowkeepers sell milk which just saves them from prosecution, that they reduce the quality of their milk by keeping back the strippings, or by adding water or separated milk, and that these are the people who come into court to give evidence that the quality of their milk is subject to fluctuation, though it scarcely ever rises above 3 per cent. the whole year round. Fraud of this sort is very profitable, and as the price of milk in the town is generally uniform, irrespective of quality, it constitutes unfair competition with vendors of high class milk. We suggest therefore that when the plea is made that milk which contains less than 3 per cent. of fats is genuine milk, the Food and Drugs Inspector should have power to be present at the next milking of the accused's cows and to take a sample. If the butter content of that sample be well above 3 per cent. it would be a reasonable presumption that some manipulation of the milk previously sampled had taken place. We believe also that a system of licensing milk sellers would enable the authorities to strike at vendors who habitually sell a poor quality of milk. An effectual means of stopping the adulteration of milk, buttermilk, and separated milk would be to amend the law making obligatory the imposition of progressive fines, as is done under the Margarine Act. If with each offence the penalty were increased it would no longer be worth the while of a trader as at present to risk detection and the possibility of a nominal fine.

(73) In making these remarks we are aware that sometimes the character of the milk vendor is at the mercy of dishonest servants. As the law stands at present the principal is responsible unless the employee is seen by someone to tamper with the milk. Circumstantial evidence will not be taken, but we suggest that if the dealer took a properly authenticated sample of the milk before sending it out for delivery he would, if afterwards there was a prosecution for adulteration in respect of that milk, be in a good position to defend his own character against the charge. Supposing, however, the dealer's sample was faulty, it would enable him to trace back the fault either to his own farm or to the producer who had supplied him. The object of the Food and Drugs Inspector is not to bring prosecutions, but to put down fraud, and the more effectively he can do this the better for the honest trades, as well as the public.

Another recommendation we make is that a prosecution for the adulteration of milk should lie against the vendor. If he hold a warranty his remedy should be in a civil action against the person who sold the milk to him. This would enable the local authority to deal with the offence promptly, effectively and inexpensively, and would make the purchaser reasonably careful to deal with reputable producers.

Analyst's certificate in regard to the adulteration of milk.

(74) There appears to be diversity of practice among analysts when issuing certificates on which prosecutions are based where milk falls below the standard. The cause may be (a) adding water to milk, or (b) depriving milk of its cream. Sometimes separated milk is added instead of water. We think a uniform certificate should be used stating the percentage of fat in the milk, and the percentage of solids not fat. The addition of water should only be certified when there is proof that water has been added.

Proposed amendments of the law re power to take samples of milk, labelling of milk, etc.

(75) For the protection of the milk supply from adulteration we consider that amendments of the Food and Drugs Acts in the following respects are necessary.

The maximum penalty for refusing to sell a sample of milk to a Food and Drugs Inspector is £10: on conviction for adulterating milk there is no limit to the penalty.

which may be imposed. It follows that in some cases a vendor might prefer to refuse to give a sample of milk which he knew to be adulterated, especially if he had previously been convicted of adulteration, and run the risk of being fined up to the maximum of £10, rather than be liable to a penalty of £20 or more. We recommend that the maximum limit of the penalty for refusing to sell a sample of milk to a Food and Drugs Inspector be removed.

Fawcett, 2718-9.

Recommendation.

(76) As the law stands, an Inspector can only demand a sample of milk if it is exposed for sale within the view of the purchaser. If it is kept under the counter of the shop, or is kept in a store or a kitchen, it is not, within the meaning of the law, exposed for sale, though if the Inspector has proof that when kept in such places it is used for sale a sample can be demanded. This restriction is obviously undesirable and causes difficulty in the detection of offenders guilty of mal-practices. The more active a local authority becomes in prosecuting offenders, the more inclined are fraudulent dealers to resort to subterfuges. Evidence was given that an Inspector has stood outside a milk shop and seen a child go in with a jug and come out with milk in it, and when the Inspector went into the shop afterwards she was told they had no milk for sale. In any case, a kitchen or living room is a most unsuitable place for the storing of milk. The Dairies Order provides that milk shops shall be kept clean and wholesome (Art. 11), and that milk for sale shall not be stored in any room used as a kitchen or as a living room (Art. 13); but the law does not give a Food and Drugs Inspector power to go into a kitchen to see if milk is being stored there.

Fawcett, 2713-5, 2731-3.

Miss H. Hayes, 2906.

A case was brought under our notice in which the Inspector was refused a sample of milk from a churn kept in a store. The story is best told in the words of the witness. "On one occasion when visiting the store I asked for a pennyworth of new milk out of the churn in the store, and the man refused to give it. The mistress also said that she would not give it out of the store, but that she would give it out of the shop. When the man refused me I went into the shop to the mistress and she said that the milk in the store was milk that was about to be sent to somebody and that the amount in it was marked down and could not be sold. I told her I only wanted a small quantity and that she could easily replace it, but she refused to give it. I instituted proceedings, and when serving the summons was told by the proprietor that the milk could not be sold because it was for churning. The case came before the magistrate, and a great many witnesses were examined. The case against the defendants were dismissed because, although the man himself proved that the churn from which I asked the sample had been out in the car all the morning and milk had been sold from it, and that the milk in it was over from the morning's delivery, the magistrate held it was not exposed for sale and therefore I had no legal right to ask for it. The man was asked whether if his supply in the shop ran short, and if a customer came in, would he refuse that person a pint of milk from what he had in the store, and he said he would. The magistrate did not rely very much on the evidence, but in face of the law he had to dismiss the case because the store was not open to the public. The same frauds are carried on as regards butter and margarine."

Miss H. Hayes, 3000.

Recommendation.

The remedy we suggest for the foregoing state of affairs is that the premises of a milk vendor which are used for the sale and storage of milk should be licensed; they should be wholly cut off from the dwelling apartments, and all milk, buttermilk, separated milk, etc., kept on the licensed premises should be considered exposed for sale, thus giving the Inspector a right to demand a sample of any milk found thereon. This would not, of course, prevent a dishonest vendor keeping milk in a kitchen and selling it surreptitiously. To meet such cases, it should be made a punishable offence if discovered, in addition to any penalty that might be imposed if the milk sold from the kitchen was found to be adulterated. The Inspector should have power to go into the private dwelling apartments communicating with the shop or store of a milk vendor if he has reason to believe that milk for sale is stored in them.

Fawcett, 2763-5.
H. Hayes, 3040.

(77) Another matter requiring attention is the labelling of separated milk. We again quote the evidence of Miss Hayes. "I saw some churns containing skimmed milk. To an ordinary observer it was like new milk. I was of opinion then that under the circumstances it should be labelled. I told these people to label the milk. They neglected to do so, and proceedings were instituted. The case was adjourned for the purpose of having the Board of Agriculture consulted, and the

H. Hayes, 3002.

Chalmers, 30965.
Recommendation.

result of their evidence was that the labelling only applied to the milk in tins, not in open receptacles, such as crocks or churns.⁶ We recommend that it be required by law that separated milk and sterilised milk exposed for sale should be labelled as such and kept in a part of the shop within view of customers.

INFECTIOUS DISEASE TRACEABLE TO MILK.

McWearney, 374,
375, 487
Robertson,
22216-3.

(78) Reverting to the question of contamination, it is well known that milk has frequently been the means of disseminating disease, such as typhoid fever, infantile diarrhoea, diphtheria, scarlatina, and tuberculosis. The sources of infection may be contact with a person suffering from disease or with the hands or clothes of a person carrying infection: the indirect causes are the washing of milk vessels with impure water. The precautions necessary to guard against these forms of contamination relate to the handling and storing of milk, as well as to its production.

The provisions made for the protection of milk from infection are contained in the Infectious Disease (Prevention) Act, 1890, the Public Health Act of 1907, and the Dairies, Cowsheds and Milkshops Order of 1908. Under section 4 of the Act of 1890 a local authority has power to forbid within its district the sale of milk suspected of having caused or being likely to cause infectious disease, and this prohibition continues in force until the local authority is satisfied that the milk supply has been changed or that the cause of the infection has been removed.

Trumble, 6238

(79) The relevant sections of the Act of 1907 are as follows:—Section 52 (1). If any person knows that he is *suffering from an infectious disease*, he shall not engage in any occupation or carry on any trade or business unless he can do so without risk of spreading the infectious disease.

Section 53 (1). If the Medical Officer certifies to the local authority that any person in the district is *suffering from infectious disease* which the Medical Officer has reason to suspect is attributable to milk supplied within the district, the local authority may require the dairyman supplying the milk to furnish to the Medical Officer within a reasonable time fixed by them a complete list of all the farms, dairies, or places from which his supply of milk is derived during the last six weeks, and if the supply or any part of it is obtained through any other dairyman, may make a similar requisition upon that dairyman.

Section 54 (1). Every dairyman supplying milk within the district of the local authority from premises whether within or beyond the district aforesaid shall notify to the Medical Officer *all cases of infectious disease* among persons engaged in or in connection with his dairy, as soon as he becomes aware or has reason to suspect that such *infectious disease* exists.

(80) The Dairies Order of 1908 directs the following specific precautions to be taken for the protection of milk against infection or contamination:—

ARTICLE 13 (1). Every purveyor of milk or person selling milk by retail shall take all reasonable and proper precautions, in and in connection with the storage and distribution of the milk, and otherwise, to prevent the exposure of the milk to any infection or contamination.

(2). He shall not deposit or keep any milk intended for sale—

(a) In any room or place where it would be liable to become infected or contaminated by impure air, or by any offensive, noxious, or deleterious gas or substance, or by any noxious or injurious emanation, exhalation or effluvia; or

(b) In any room used as a kitchen or as a living room; or

(c) In any room or building, or part of a building communicating directly by door, window or otherwise, with any room used as a sleeping room, or in which there may be any person suffering from any infectious or contagious disease, or which may have been used by any person suffering from any such disease and may not have been properly disinfected; or

(d) In any room or building or part of a building communicating by door window or otherwise, with any room or place in which it might be liable to

become infected or contaminated by impure air, or by any offensive, noxious or deleterious gas or substance, or by any noxious or injurious emanation, exhalation or effluvia; or

(e) In any room or building, or part of a building in which there may be any direct inlet to or in connection with any drain.

(3) He shall not keep milk for sale, or cause or suffer any such milk to be placed, in any vessel or utensil which is not thoroughly clean.

(4) He shall cause every vessel or utensil used by him for containing milk for sale to be thoroughly cleansed with steam or clean boiling water after it shall have been used, and to be maintained in a constant state of cleanliness.

(5) He shall not wash or scald any vessel or utensil used by him for containing milk for sale in any boiler, tub, or other receptacle which is used for washing or boiling bed or body clothing.

(6) He shall not milk or cause or suffer any cow belonging to him or under his care or control to be milked for the purpose of obtaining milk for sale—

(a) Unless, at the time of milking, the udder and teats of such cow are thoroughly clean; and

(b) Unless also the hands and clothing of the person milking such cow are thoroughly clean and free from all infection and contamination.

(7) He shall not distribute milk or cause milk to be distributed by means of any person whose hands and clothing are not thoroughly clean and free from all infection and contamination.

ARTICLE 14 (1). Every purveyor of milk, or person selling milk by retail, shall, immediately on the occurrence of any case of infectious or contagious disease within the buildings or upon the premises in which he keeps milk, or amongst the persons employed in his business, coming to his knowledge, give notice of such case to the Local Authority.

(2). He shall also, immediately on the occurrence of such case coming to his knowledge, remove all milk for sale and all utensils for containing milk for sale from such building or premises, and shall cease to keep milk for sale or to sell milk in such building or premises until the same has or have been disinfected and declared by the Medical Officer of Health of the district to be free from infection.

ARTICLE 15. It shall not be lawful for any person following the trade of cow-keeper or dairyman, or purveyor of milk, or being the occupier of a milk-store or milkshop—

(1) To allow any person suffering from pulmonary tuberculosis or any other infectious disorder, or having recently been in contact with a person suffering from any such other infectious disorder, to milk cows, or to handle vessels used for containing milk for sale, or in any way to take part or assist in the conduct of the trade or business of the cowkeeper or dairyman, purveyor of milk, or occupier of a milk-store, or milkshop, as far as regards the production, distribution, or storage of milk; or

(2) If himself so suffering, or having recently been in contact as aforesaid, to milk cows or handle vessels used for containing milk for sale, or in any way to take part in the conduct of his trade or business, as far as regards the production, distribution, or storage of milk;

until in each case all danger therefrom of the communication of infection to the milk, or of its contamination, has ceased.

Other provisions of the Order are framed to ensure the cleanly production and handling of milk, and in particular Art. 10 (6) (a) requires every dairy to be provided with an adequate supply of wholesome water for the cleansing of the dairy and the utensils used therein.

Typhoid and Diphtheria Carriers.

(81) In all these provisions it will be observed the reference is to "persons suffering from infectious disease"; no cognisance is taken of the disease "carrier," because at the time when a great many of the Public Health Acts were passed the existence of the "carrier" was unknown. It is now, however, a well established fact that persons who have recovered from an attack of typhoid fever may apparently be in perfect health and yet carry typhoid bacilli in their blood. Some persons have suffered from the infection in so mild a form (ambulatory type) that they have failed to recognise the fact, and they too may become carriers. Similarly, a person who has suffered from diphtheria may carry in his throat the virus of the disease long after his apparent recovery. The carrier is himself usually unaware that he is a carrier and is, in consequence, a greater menace to the public health. He is a very real source of danger if employed in certain callings, of which that of dairy hand is one. It is estimated that five out of every hundred persons who have recovered from typhoid fever become carriers. Accepting this estimate as correct and applying it to the public health statistics furnished for the city of Dublin, there are in that city alone every year twenty persons who, from the standpoint of public safety, become ineligible for employment in the dairy trade. No time limit can be put to the duration of the danger of a carrier, and the dictum is that "once a carrier, probably always a carrier."

The typhoid carrier can be discovered by means of the Widal test, which is perfectly harmless, causes no more pain than a pin-prick, and does not involve isolation or inconvenience to the person tested. The method by which the diphtheria carrier can be identified is even more simple than the Widal test.

Our attention has been directed to several outbreaks of infectious disease traceable to carriers, notably to an outbreak of typhoid fever affecting twenty-five persons at Kilworth camp, which was the subject of reports by Dr Browne, Medical Inspector to the Local Government Board, and Professor McWeeney, printed in the 38th Annual Report of the Local Government Board for Ireland (pp. 66 and 105, respectively). This outbreak, it may be mentioned, was the first in this country to be traced definitely to a carrier.

An amendment of the law re infectious disease necessary.

(82) The law regarding infectious disease in relation to the dairy trade needs revision and extension. Two typical cases, one in Dublin and the other in Belfast, will illustrate this. In Belfast the Medical Superintendent Officer of Health traced an outbreak of diphtheria to a particular milk supply, but when he visited the farm from which the milk came he was informed that there was no sickness in the dairyman's family or among his employees. Further cases of diphtheria having occurred, the supplier's premises were again visited and an informal inspection was made, during which the Medical Officer asked permission to examine the throat of a boy who was sweeping out a hyre while milking was going on. Permission was refused, and the Medical Officer was ordered to leave the premises. Armed with a magistrate's order he, with the City Veterinarian, called again next day, but had to leave owing to the threatening attitude of the dairyman's wife. Two days previously the Medical Officer of Health of the district in which the supplier lived had given a certificate that the family and servants of the proprietor were absolutely free from disease of any kind. The Belfast Public Health Authority threatened to forbid the sale of the milk in the city, and the dairyman then consented to the Medical Officer of Health of Belfast making an inspection of his premises. An examination of a secretion from the throat of a son of the dairyman showed the presence of diphtheria bacilli, and preventive measures were at once taken. From the first visit of the Medical Officer to the farm to the date of the discovery of the diphtheria bacilli an interval of sixteen days elapsed. This delay where infectious disease is concerned is very serious, and might have been considerably curtailed if in the first instance the Public Health Officers had had power to examine the throats of all persons connected with the dairy.

(83) In Dublin the Medical Superintendent Officer of Health called attention to a defect in the law which prevented the Public Health Authority from taking prompt and effective action to stay an outbreak of enteric fever. In a district containing over 12,000 inhabitants and supplied with milk by twenty dairy proprietors,

McWeeney, 381.

Dr C. Cameron,
214.

McWeeney, 584.

Cameron, 1345.

Thomson, 6090.

Trumble, 6888.

McWeeney, 407-8.

410-1.

Cameron, 1165.

Symonds, 6750.

McWeeney, 384.

Symonds, 6850-3.

Cameron, 1345-71.

869-10, 1176.

McWeeney, 383.

Trumble, 6810.

Cameron, 381.

McWeeney, 382.

390.

Cameron, 1165.

1178.

Trumble, 6807-8.

Thomson, 6101.

Thomson,

6094-200.

Harris, 9701.

W. A. Bell, 9666.

Dr C. Cameron,

354.

there were at one time 133 cases of enteric fever, of which 123 were supplied with milk from one particular dairy. There can be no possibility of doubt that the milk from the dairy in question was infected, but the Public Health Authority were advised by their Law Officers that under existing regulations they could take no action to prevent the milk from being sold.

(84) It has been suggested by witnesses that persons employed in the dairy trade (excluding those engaged feeding cattle) should be subjected to the Widal test and should be disqualified for such employment if found to be typhoid carriers. Dairy-men have offered no objection to this proposal—they have agreed that all reasonable precautions should be taken to safeguard milk from infection from this hidden source of danger; and the objection comes from another quarter, based on the grounds that it is unnecessary, and impracticable on account of the labour and expense that would be involved.

Notwithstanding the number of typhoid carriers in existence, the number employed in the dairy trade is probably very small. Outbreaks of typhoid due to infected milk are exceptional, and it is very questionable whether merely as a precautionary measure it would be wise to subject all persons in the dairy trade to the test periodically. What does appear to be necessary, and what we recommend, is that if the milk of a particular dairy is suspected of causing typhoid or diphtheria, the Public Health Authority of the district in which the outbreak occurs should have power (1) to take the necessary steps to ascertain if there is a typhoid or diphtheria carrier (as the case may be) in the family or employment of the milk seller, and pending the result of investigations to suspend the sale of milk from that dairy; and (2) to go at once without a magistrate's warrant to the farm of the supplier and require all persons in his employment to give facilities for tests to be made, failing which the authority should have power to forbid the sale of the milk of that supplier within their area. We recommend also that any dairy hand known to have suffered from either typhoid fever or diphtheria should be obliged to comply with such requirements as the Public Health Authority may consider necessary for the purpose of ascertaining if he be a carrier of disease. If such person declined, he should be debarred from employment in the production or handling of milk.

(85) We recommend further that the Public Health Authority should have power to stop the sale of milk from any dairy in their district if there is epidemiological evidence that it is the vehicle of infection, notwithstanding that (1) there is no disease in the family or among the employees of the dairyman, (2) that no diseased carrier may be discovered on or in connection with the premises, and (3) that no other source of infection can be traced. The contamination by sewage is sometimes too obscure to be readily discovered. A case in point occurred at Howth, particulars of which were given by the Medical Superintendent Officer of Health. "There were about fifteen or sixteen cases . . . scattered all over Howth. A lot of them were campers-out there in the summer, and it was found that they had all the same milk supply. The milk was supposed to be sterilised milk. The epidemic was accounted for in this way—a man whose family had typhoid in Clontarf took a house on the Hill of Howth and developed typhoid himself. The dejects from this patient was thrown into a sort of ashpit. There was a sort of drain from this ashpit running into a stream which ran by the premises of a dairyman who washed his cans in the stream. That was what spread the epidemic in that case. In that particular case we could not stop the sale of the milk." The powers conferred by the Infectious Disease (Prevention) Act of 1890 do not meet a case of this sort. Section 4 provides that if on the inspection of the dairy the Medical Officer of Health shall be of opinion that infectious disease is caused by the consumption of the milk supplied therefrom, the legal machinery for forbidding the sale of the milk may be set in motion. The inspection of the dairy or farm may not reveal any cause of infection, and an amendment of the law in the direction we have indicated is desirable.

(86) It was represented to us that a local authority has got at present practically no power to forbid the continuance of a milk supply from a suspected source of infection. An official of the local authority can attend at the railway terminus and make an inspection of the vessels in which the milk is supplied, and if there is any evidence of want of cleanliness he can then take action in regard to that consignment,

Symonds, 6749-51,
6856-69

Sir C. Cameron,
1213.

H. W. Baile,
6478.

Recommendation.
Symonds, 1861-6.

Thomson, 6107-8.

Recommendation.

Recommendation.

M'Waters, 479.
Symonds,
3213-25.

O'Donoghue, 639.

Sir C. Cameron,
354-6.
H. Brown,
2538-40.
Tumble, 6386.

Sir C. Cameron,
320-6, 363-6

but it is impossible for him to forbid the continuance of the supply from the same farm. The tabular statement handed in by the witness representing the Local Government Board (see Appendix C, page 191, vol. 3 of the Evidence) shows how numerous have been the cases in which infectious disease has been spread by milk or separated milk. It is obviously essential for the maintenance of the public health of large cities that County Boroughs should have power to prevent milk coming in from an infected centre, and we recommend that the necessary power be conferred. It could be left to the Local Government Board to determine what constitutes an infected centre.

Recommendation

Compensation for suspension of milk dealer's business on outbreak of infectious disease

(87) Where a local authority has ordered the suspension of the sale of milk by a licensed milk vendor because of the suspected existence of infectious disease in his family or among his employees, the local authority should, we consider, in justice be required to give compensation for the loss of business involved, in the event of the suspicion proving groundless. We are prepared to go farther and to recommend that even where the business of a milk dealer is suspended on account of the proved existence of infection in his family or among his employees he should be compensated, provided he complies with the instructions of the Medical Officer of Health for preventing the continuance of the infection. We suggest this course in the belief that it would induce the vendor to notify the existence of infectious disease at the earliest moment.

Recommendation

Dr. B. Carreras,
22147

Murphy, 20004-7.
McDonough,
20040-5.
Lord Ashdown
20072-89.

Proposed compulsory notification of disease to dairyman's family by medical practitioner.

(88) Under the Tuberculosis Order of 1913, a Veterinary practitioner who, in his private practice, discovers a cow suffering from certain diseases of the udder or from tuberculosis with emaciation, is required to report the case to the local authority and to the Department of Agriculture, for which service he receives a notification fee. The object is to prevent the dissemination of disease through the medium of milk. For the same reason, we recommend that any medical practitioner who shall, in the course of his private practice, be called in to attend a dairymaid, his family, his employees or their families, or any person supplying milk to a creamery, suffering from an infectious disease, shall notify the existence of the disease to the local Public Health Authority and shall be entitled to receive therefor a notification fee. For failure to report there should be a heavy fine. Creamery managers should send periodically to the local Health Authority a list of the names and addresses of their milk suppliers, and on the occurrence of infectious disease in the house of a supplier the local authority should notify the creamery manager of the fact. The principle of compulsory notification by medical practitioners has already been recognised in the Tuberculosis Prevention (I.) Act, 1908.

J. M. Bailey,
8043.9

Reexamined often

Infantile Diarrhoea

(89) Another malady caused by unclean or impure milk to which we desire to draw attention is infantile diarrhoea. Cases occur in summer in such numbers as to constitute an epidemic. As much of the contamination takes place in private dwellings, especially in the homes of the poor, care should be taken to keep the milk under proper conditions: *e.g.*, in clean, open vessels in a cool, airy place, not near a fire, nor in a closed press. It should be protected from flies and at a distance from substances likely to taint it; above all, as far away from an ashpit or manure heap as possible. The danger of disease by flies infecting food is now fairly well known; but what makes them specially dangerous is that they introduce multitudes of pathogenic germs into the milk, which is an excellent nutrient medium for bacteria. The sterilisation of milk by boiling immediately before use is advisable where contamination is suspected. The use, especially for infants, of bottled milk, as sent out from infant milk depots and by some commercial dairies, is another safeguard.

M'Wooley, 374.
Lunsden, 5077-80.
Dunstan, 12389, 12393.
Lee, 18268.
Loid 2090-10.
Trimble, 6008-11.
Gunnar, 333.
Symons, 6841.
Dunstan, 12169.
M'Wooley, 416-20.

Niren, A. 2010

LONG-TUBE BABIES' BOTTLES.

(90) Before passing from this subject we must refer to the use of the long-tube feeding bottle for babies. Under the most approved conditions it is difficult to keep the bottle and tube perfectly clean; where there is neglect of hygienic precautions the tube is a source of incalculable danger. The extent of the danger is forcibly expressed by a medical witness who said, "I think that the person who invented that bottle killed more of the human family than Napoleon ever did in his wars." The same witness testified to having been called on to see children who were fed from long-tube bottles, the smell of which were sickening. The evidence of medical men and other qualified witnesses strongly condemned the use of such bottles. In France their use is illegal, and we think their use in the United Kingdom should be forbidden by law. Lobd, 26910.
Recommendation.

CONTAMINATION OF MILK IN SHOPS.

(91) For the prevention of contamination of milk in shops we think the existing powers are sufficient, if exercised. Articles 11 and 12 of the Dairies Order require milk sellers to keep their premises in a thorough state of cleanliness and to thoroughly cleanse with steam or clean boiling water all milk vessels used for containing milk for sale; and in addition it is open to a local authority to make further regulations, subject to the approval of the Local Government Board, for the purposes mentioned in section 34 of the Contagious Diseases (Animals) Act of 1878. We recommend, however, that no milk shop shall be licensed which is not shut off completely from the dwelling apartments, or in which articles likely to contaminate milk are sold; and also that no milk for sale shall at any time be stored in a kitchen or dwelling apartment. Moreover, milk vendors should be obliged to send to the local sanitary authority a list of the names and addresses of their attendants, in order that the authority may take the necessary precautions in the event of an outbreak of infectious disease in their homes. Recommendation.
Walton, 1875-8.

(92) We commend for general adoption the following regulations made by the Dublin Corporation:— Recommendation.

Every person while engaged in the milking of cows shall wear a linen or cotton blouse (smock frock), which shall be kept in a cleanly condition and in good repair, and shall not be used on any other occasion. The blouses must be kept on the premises by the cowkeeper and in such a place as to ensure freedom from contamination, and be at all times accessible for examination by the Inspector.

No cart or vehicle used for the conveyance of milk shall be used for the conveyance of offal or other objectionable matter.

No vessels used for the conveyance of milk shall have any paper, except that known as vegetable parchment, interposed between the lid and such vessel; and where cloths are used, only clean white linen shall be used for that purpose.

Where, after the publication of these Regulations, new churns or other vessels are provided, no strip of brass or other material shall be soldered inside of any such churn or other such vessel, so as to prevent uncleansable interstices from being formed by such strip becoming loose, in which milk could remain and decay, or verdigris or other noxious matter could form to contaminate milk kept in such vessels.

We think that in the same way that a sanitary authority prescribes the use of certain standard types of dust-bin, and keeps them for sale, so they might prescribe and keep for sale standard types of milk vessels. Tankards should be so designed as to be easily cleaned, and without a brass measuring strip inside; the lid should fit over the sides, thus making the tankard rainproof, and should be tight fitting, without ventilating holes.

CARRIAGE OF MILK BY RAIL.

(93) The ideal method of handling milk by rail would be that it should be conveyed in separate vans, which should be cooled by refrigerators in hot weather. The

- Neale, 9965-2. evidence of the Traffic Manager of the Great Southern and Western Railway Company was that refrigerating cars have never been asked for, though the Company would consider the expediency of providing them, if necessary. The Company, we were informed, had provided refrigerating cars for the carriage of butter, and as a matter of experience it was found that the extra cost of the ice deterred persons from using them ordinarily. We think it is needless to require Railway Companies to incur the expense of providing special equipment unless there is a fairly general and sustained demand for it. We do think, however, that there is need for the provision of special milk vans on trains which carry milk traffic, and we are aware that as regards the only railway system concerning which we took evidence a special milk van is provided. The Traffic Manager of that line held out no prospect of railway companies providing places at their termini where milk could be transferred from tankards to carts, or where samples could be taken by the Health Authorities and Food and Drugs Inspectors. We think that at least the Companies should arrange that at the termini the milk traffic should be dealt with at one particular platform, and that while the traffic is being handled there should be no avoidable cause of contamination. Railway companies do not constitute themselves inspectors of milk or milk cans. The companies are carriers and such precautions as they take are for their own protection. But we think it would be at once in the company's interest and that of the public health if all consignors were required to send their milk in sealed cans, even if it were necessary to obtain special powers to require this to be done. But it is the duty of the local sanitary authority rather than that of a carrying company to protect the citizens against the sale of dirty milk. We think that in some cases much good would be done if the municipal authority would provide a dépôt or market for the transfer of milk from the railway station to the vendors' carts; or, when large supplies come in from the adjoining country along a certain road, for the transfer of the milk from the farmer's cart to the delivery van. Facilities might be given for encouraging cleanliness in such dépôts or markets, such as a plentiful supply of hot and cold water. If, after experimenting with such dépôts, they were found to work successfully, it might be possible to forbid the sale of milk from one cart to another in the street. Samples for analysis could be obtained with a minimum of trouble at such dépôts, and the inspectors would more easily locate individuals who persisted in sending their milk in a filthy condition. Accommodation might be provided at each dépôt for one or more stalls or shops, which could be rented by milk vendors in the retail trade to sell milk to the public in the ordinary way. A scheme of this kind would both facilitate the increased sale of milk under reasonable inspection, and would indirectly be of much educational value in inculcating habits of cleanliness in the trade.
- Mason, 944.
- Neale, 9965-25.
9966-7, 10006-9.

DIRTY MILK.

- (94) We consider that more prompt and effective means of preventing the sale of dirty milk are necessary. Straining milk to remove the visible dirt is not sufficient. The ordinary inspection of milk is made by the Food and Drugs Inspector for the purpose of detecting adulteration. The Public Health Authority can forbid the sale of milk which has caused, or is likely to cause, infectious disease; but the only power to deal with dirty milk is that given by Sections 132 and 133 of the Public Health Act, which enables a sanitary inspector to seize milk which appears to be infected or unwholesome and have it condemned by a magistrate. In practice, however, this procedure does not appear to be efficacious. We consider that the power to seize and condemn dirty milk should be extended to the Medical Officer of Health. Being on the spot he could act promptly, and having a wide experience his judgment would be sound.
- Delaplace, 31358-70.
- Smith, 179-4.
- 186, 6467-75, 6517-80, 6696-706, 6711, 6842-9.
- Recommendation.

(95) The question has been raised as to fixing a standard of clean milk by naming the maximum bacterial content permissible, but we do not think that as yet any satisfactory method of standardising milk bacteriologically has been suggested.

BACTERIOLOGICAL EXAMINATION OF MILK.

(96) It is, however, desirable on general grounds, and more particularly in view of the Tuberculosis (Ireland) Order of 1913, that means should be provided

for the bacteriological examination of milk for the detection of tubercle bacilli. In England the Public Health Authorities of most of the large cities make provision for this purpose, but in Ireland, with the exception of Belfast, we know of no city which makes a systematic attempt to examine bacteriologically its milk supply. A microscopical examination, though more easily made, is of limited value. On the other hand few cities in Ireland are prepared to incur the cost of arranging for an efficient bacteriological examination solely for their own protection. We suggest, therefore, that a number of central stations be equipped and placed in charge of competent persons, say, in Dublin, Belfast and Cork. Each station would have attached to it a fixed geographical area, and all samples taken in that area would be sent to the central station for examination. By these means it would be possible for officials of a Public Health Committee to take samples of milk coming in from outside by rail, irrespective of the appearance of the vessels, and to send the samples to the central station to ascertain if they were infected or not. If a sample were infected, the Public Health Committee could report the matter to the local authority in which the farm supplying the infected milk is situated, and should have the power to forbid (if necessary) the sale of the milk from that farm until there was reason to believe that the milk was no longer infected.

Symons, 1707-8.

McWenney, 308.
Delapine, 31764-7,
31802-3.**Recommendation.**
A. Wilson, 1314,
1621.Symons, 1763,
1785.

McWenney, 300.

(97) In making the foregoing recommendation we contemplate that the public health authorities will take samples on their own initiative for their own protection. It is also necessary for veterinary inspectors acting under the Tuberculosis Order of 1913 to take samples of the milk of cows suspected of tuberculosis. For this purpose we recommend that a central station should be equipped at which these samples should be examined.

Recommendation.

EDUCATION OF DAIRY HANDS AS TO NEED OF CLEANLINESS.

(98) Inasmuch as contamination at the source is most serious and most frequent, special efforts should be made to educate dairy hands as to the necessity of cleanliness. We recommend that a few plain rules, with simple explanations, be printed on a card and hung in every cowshed and milkshop; and because the chief danger arising from the existence of typhoid carriers is caused by want of cleanliness on their part, the rules should include reference to the importance of the washing of hands after the use of closets. Compulsion is often necessary for the enforcement of sanitary regulations, but we believe the best results will be obtained by an appeal to intelligence and common-sense. As an example of what may be done in this way we quote the evidence of Mr. P. J. Howard, M.R.C.V.S., in respect of building improved cow byres. He says, "Some few years ago, before there was any talk of putting these Orders into force, there was an entertainment in a public hall, subscribed for principally by Lord Inchiquin, at Newmarket-on-Fergus. Lord Inchiquin and the parish priest asked me to give them a lecture; and we selected tuberculosis and the milk question as the subject of the address. Within a week after giving the lecture, I had at least twenty farmers in the district coming to me for advice as to what to do with their places, and in that district you would find two or three model byres at the present time, and they began in that way. . . . I mention my lecture for the purpose of showing you that the people will try to follow an example when they think it is for their own advantage. . . . In the country districts I always find the young farmers coming to me and asking me for advice, and lots of them would take steps to put my advice into practical effect. . . . It is impossible to drive them, but you can lead them."

Recommendation.

16383-9.

STERILISATION AND PASTEURISATION OF MILK.

(99) The treatment of ordinary milk in households to guard against the dangers of contamination and infection leads to the consideration of the vexed question of pasteurisation and sterilisation. If ideal conditions prevailed, or if every large town had a supply similar to that provided by Mr. Gunn Busck for Copenhagen, there would be no need to sterilise milk. We commend to notice the evidence given by Mr. Warnock relating to the Copenhagen Milk Supply Company. We were told that the effect of this enterprise has been to raise the standard of cleanliness among other milk dealers; that the public have been educated to demand good milk; and that there is a growing practice amongst workmen and others to take milk with their mid-day meal instead of beer. Mr. Busck does not pasteurise the milk. His opinion is that "he who pasteurises good milk is a fool, he who pasteurises bad milk is a rogue."

Warnock, 4001.

3992.

Prof. Thompson,
1618-20, 1716-184.
McWeeney, 461-4.
Symonds, 6799.

McWeeney, 454.
Lansden, 4979.

McWeeney, 448.

McWeeney, 448.

Dokipno, 387-62-6.

6229, 449-50, 493.

McWeeney, 458

(100) The maximum amount of nourishment is obtained from pure milk when in its natural state. Boiling or heating deprives it of some of its nutritive qualities. Nevertheless, under present conditions, the pasteurisation or sterilisation of milk sold in large towns is a precautionary proceeding which has been recommended by many medical men, especially when infectious diseases are prevalent.

To sterilise milk it is necessary to raise it to a temperature sufficient to destroy all micro-organisms. Unfortunately, while this method makes milk innocuous as a vehicle of disease it also devitalises it, and it is advisable to replace the enzymes which the milk has lost in the process of heating by introducing the juice of fruit—of an orange or grape—or the juice from raw beef. On the other hand, sterilisation has the merit of being simple, as well as effective. Milk can easily be boiled in the home immediately before its consumption and therefore before there is opportunity for the introduction of fresh germs: this is the more important, because in sterilised milk there is greater freedom than in raw milk for the development of any germs that may gain access. Pasteurisation is a process which heats milk to a temperature less than that of boiling point sufficient to kill ordinary germs, but not spores. There are two methods, the flash and the holder. In the first, milk is raised to a high temperature for a short time—Professor McWeeney puts the necessary temperature at 195° Fahr. for continuous-flow machines (see Appendix E (11), page 364, vol. 1 of the Evidence); in the second, the milk is held at a lower temperature for a longer period. Neither process ordinarily kills the spores of putrefactive organisms that may be in the milk; and the lactic acid bacilli having been killed, pasteurised milk is a favourable medium for the multiplication of putrefactive germs which may be present in it, or may afterwards be introduced. Pasteurised milk should be kept cool and in bottles, which should only be opened just before use. A description of the treatment of milk at the Dublin Pasteurised Milk Depot, Sitric Road, will indicate the approved method of pasteurising and handling milk. The milk when received is run into bottles, closed by stoppers which hermetically seal them. It is then pasteurised by being raised to a temperature of 156° F., at which it is kept for not less than twenty minutes. Upon being taken from the pasteurizer the milk is rapidly chilled, when it is ready for sale—the price being 4d. per quart. The bottles can be opened in the home, part of the contents used, and be closed again by means of the patent stopper, thus preventing all possibility of contamination. Bottles, stoppers, and all vessels used in connection with the pasteurisation are cleansed and sterilised by boiling. We have already spoken of the Depot as a means of providing poor sick children with pure humanised milk, made up according to different formulae; we now deal with it simply as illustrating the best method of handling pasteurised milk. Much of the so-called pasteurised milk which is sold commercially is imperfectly pasteurised in open containers; there is no fixed standard as to what constitutes pasteurisation, and milk is sometimes pasteurised because it would not be saleable as fresh milk. Under the milk regulations for Copenhagen, it is required that pasteurised milk shall be heated up to at least 172° Fahr. and immediately afterwards cooled down with a cooling apparatus to 46° Fahr. or less. The advisability of using pasteurised milk is a matter of controversy; opinions for and against its use were given to us by competent witnesses. This, however, may be said: milk which is contaminated after pasteurisation is far worse than milk in its natural state.

EFFECT OF TEMPERATURE ON MILK.

(101) It is not within our province to enter into a dissertation as to the nature of bacterial contamination, but for popular information it may be stated that the lactic acid germs, which are a powerful protection against the putrefactive process which goes on in milk, are among the first to be destroyed by heat. Typhoid germs in milk are killed at a temperature of from 150° to 160° Fahr. kept up for a short time. A reason for keeping milk cool is that the bacillus typhosus multiplies at all temperatures between 8° C. (46° F.) or 10° C. (50° F.) and 40° C. (104° F.); tubercle bacilli do not multiply until the temperature reaches about 30° C. (86° F.), and even then very slowly. If milk were kept cool at about 10° C. (50° F.) from the time it left the cow it would be a fairly good safeguard and would check multiplication of organisms. These are the reasons why milk should be carried in refrigerating railway cars in hot weather, should be protected as much as possible from the sun's rays when being carried in carts, and should be stored in a cool place in the home.

McWeeney, 457.

441, 490-1.

444.

445.

DRIED MILK.

(102) Reference has been made by witnesses to the use of dried milk. This is the name given to milk which has been deprived of its watery contents by exposing it momentarily to great heat. In appearance it is powdery; it is dissolved in hot water. The cost is equivalent to about 4½d a quart. The claim for dried milk is that it retains the subtle nutritive qualities which are injured by boiling, that it is less liable to contamination than pasteurised milk, and that it is especially useful for that reason in the homes of the poor. It can be kept like rice or sago in a tin without deterioration for use as required. Dried milk has, we were told, been successfully used in various English and Scottish towns for the feeding of infants and as a preventive of infantile diarrhoea. Dr. Scurfield, Medical Officer of Health of Sheffield, handed in a paper by Dr. A. E. Naish on Infants' Depôts in Sheffield, which was read at the Public Health Congress held in Leeds in 1909, from which we take the following quotation:—"I am one of those who strongly believe that the great majority of the difficulties encountered in the feeding of infants on cow's milk can be successfully overcome by an intelligent modification of the milk to suit the needs of the particular infant. But such modifications mean often the expenditure of much time, trouble, and money, and are often entirely beyond the means of the mothers whom we wish to help most. Granted that they have sufficient intelligence, application and patience to sterilise and to carry out the exact dilution necessary, changing the dilution from day to day, as is often necessary, yet still the deficiency in fat is one which cannot be overcome without the accessibility of a pure standardised cream.

"For the average healthy infant it is reckoned that dilution should commence at 1 in 5, and should not reach half and half until three months of age. Without the addition of cream there is thus a notable deficiency of fat. In reference to this question a well-known authority makes these remarks:—"Cream is not easily obtained, and, if it is, may be of doubtful quality, so that we are constrained sometimes, especially when dealing with the poor, to use mixtures in which nothing further is attempted than simple dilution, and addition of sugar. Under these circumstances it is important that the dilution should be as little as is consistent with digestion, lest the deficiency of fat give trouble by inducing rickets, or otherwise interfering with nutrition." In other words, for most infants of poor parents there is with fresh cow's milk only a very narrow path of safety between mal-nutrition from indigestion and mal-nutrition from starvation. Add to this the fact that most infants when their mothers first seek advice are already the victims of considerable digestive disturbance, and greatly below the average weight (that is, they require greater dilution than the average, and owing to their emaciation are less able to bear those dilutions), and it will readily be seen that recourse must often be had, at any rate temporarily, to some other form of nourishment.

"Now, it has been shown that milk after desiccation is much more easy of digestion, a fact which is easily demonstrable in the case of infants recovering from acute diarrhoea. These are often unable to take fresh milk even in extreme dilution without recurrence of the diarrhoea, yet can digest comparatively concentrated mixtures of dried milk.

"It might be expected from this that infants suffering from chronic gastrointestinal trouble after the use or abuse of fresh milk would improve on dried milk, and this has been our experience. In many of these infantile dyspeptics with constant vomiting and whining, it is very striking to see how soon the symptoms abate, after even a very short course of dried milk.

"We have then to inquire whether its use is attended by an ill consequence such as rickets or scurvy. With regard to the former, it might be thought that the fat in the somewhat buttery condition in which it occurs would not be readily absorbed, but I think this is not the case. The authority I have quoted above recommends for poor people in certain cases the addition of butter to fresh cow's milk when it has to be diluted much. At any rate I know of no case in which rickets could be attributed to the use of dried milk, and several infants which have come up with rickets have been cured without other treatment than the diet

"Our aim, however, is always directed towards getting the children back on to fresh cow's milk at the earliest possible opportunity. To do this in the way least disturbing to the child's digestion I order one teaspoonful of milk to be added to each feed, and subsequently gradually increased. In some cases even this is too much, so that one has to resort to half a teaspoonful or less."

Prof. Thompson,
1884.1886.
1631-44, 1649-50.1893.
Niren, 81207-30.

CONDENSED MILK.

Prof Thompson,
1651.
Webb, 4064.
Trimble, 6257-65

Smith, 175.

Poole-Wilson,
1838.
1839-41.

Cassman, 544-7.

Recommendation.

(103) It was agreed by qualified witnesses that generally speaking condensed milk is a poor substitute for fresh milk, and for infants is not to be compared with fresh milk, still less, of course, with mother's milk. The process of manufacture is described on page 84 of the First volume of Evidence. There is no inspection of condensed milk factories by the Local Government Board from the public health point of view, which is, we consider, regrettable. The only supervision over the milk received at these factories is that exercised by the manager or his assistants. Milk may be accepted under any conditions they please. It has been known that stale and dirty milk have been received and boiled with the addition of soda, or other alkali, to neutralise acidity. There is no legal standard for condensed milk, it can be manufactured or imported without any regulations, and if persons sending milk to the factories choose to be careless there is no means of preventing them. We consider it essential that condensed milk factories should be subject to supervision by the Medical Officer of Health and the Medical Inspector of the Local Government Board, as well as by any Inspector of the Department of Agriculture who may hereafter be authorised to inspect creameries.

See M.O.H's. Re-
port for Liver-
pool, 1908.

Mosses, 31604.

Recommendation.

(104) Another recommendation we make relates to the labelling of condensed milk. There are two classes of condensed milk: (1) that made from whole milk, (2) that made from skim or separated milk. The latter contains a high percentage of sugar and a low percentage of fat, ranging from $1\frac{1}{2}$ to as low as $\frac{1}{2}$ per cent. This compares with the fat percentage of from 9 to 12 in the good class brands. There is a fair amount of variation in the composition of condensed milks, even of the same kind. The chief causes of the variation are (a) difference in the composition of the original whole milk, (b) the extent to which the condensation has been carried, (c) the amount of added sugar, and—in the case of skimmed milks—(d) the thoroughness of the skimming. Usually the purchasers of condensed milk look only to the price; they do not realise that the dearer article may be the cheapest in point of value; in fact they are not aware of the difference between condensed milk made from whole milk and skimmed milk. We recommend that all tins containing condensed milk for sale should be labelled in large prominent type, "Prepared from WHOLE—(or SKIM or SEPARATED)—milk." It is commonly believed that condensed milk is sterile. From analyses made by the Public Health Authority of Liverpool, and published in the Annual Report for 1898, only one sample was found to be sterile. The importance of this is shown by the following extract from the same report (page 146):—"Thirty-four samples of various brands of condensed milk were examined bacteriologically, and out of these only one appeared free from micro-organisms. In the others the number of organisms varied, being very abundant in some samples. No pathogenic forms were found. These observations are of importance, because no article of food of the nature of milk or meat should be tinned without making absolutely certain that it is sterilised. Spore-bearing bacilli similar to the bacillus enteritidis sporogenes can develop in the sealed tins if sterilisation is not complete, and lead to the production of irritant and harmful products. If condensed milk is not sterile it has no advantage over raw milk from a bacteriological point of view." As a proof that conditions have not improved, we quote from the Report of the Medical Officer of Health of Liverpool for 1911 (p. 207): "Condensed Milks—34 samples were investigated, and in no case were they found to be sterile. Indeed the very large numbers of bacteria which were found in all the samples would tend to show how unsatisfactory the process of condensing is. The milk, no doubt, originally contained various decomposition products due to bacteria. These products are subsequently masked by the large quantity of sugar present, but their irritant properties are not destroyed."

PRESERVATIVES.

Recommendation.

(105) We recommend that the prohibition against adding any preservative substance to milk intended for human consumption, and the restrictions on the use of preservatives in cream, imposed by the Public Health (Milk and Cream) Regulations, 1912, which were made by the Local Government Board in England last year, shall apply in Ireland.

INSPECTION OF CREAMERIES.

(106) The question of inspection of creameries requires special reference. At present a creamery is registered under the Factories Act and is subject to inspection by the Factories Inspector, who prescribes that it shall be whitewashed periodically, that the machinery shall be guarded, and that precautions shall be taken generally for the health and safety of the employees. The Local Government Board as the Public Health Authority have no direct control over creameries. As a general rule the Medical Officer of Health does not inspect a creamery, but he would do so if his attention were specially called to it. Neither has the Department of Agriculture any legal power to enter a creamery and inspect the milk received there, or to insist that the work shall be carried on under strictly hygienic conditions. A number of creameries do, as a voluntary arrangement, allow the Inspectors in Dairying to visit and report on them. The Department's role is, however, not that of guardian of the public health, but of adviser for the promotion of the butter industry. The Inspectors point out defects if they see any; if the remonstrances of the Department are ignored the only remedy the Department has is to withdraw and to refuse any assistance by way of instruction. If the owners of a creamery say they do not want the services of the Inspector, the Department has to withdraw. Of the 700 creameries, 396 are visited by the Inspectors, i.e., about 56 per cent. It is not an unreasonable assumption that those which are visited are generally the most progressive and well managed institutions of their kind, and though it must not be assumed that all those which are not visited have a poor standard of cleanliness and efficiency, it is natural to suppose that they are in the main the most in need of supervision. The absence of compulsory powers by the Inspectors, which would enable them to ensure uniformity of conditions among creameries, is a serious drawback. In one case the Committee of a creamery asked the Department to discontinue the visits of their Inspector until he had powers which would ensure equal treatment of all creameries. It appeared that the Inspector had in the course of his visit found fault with some suppliers for the manner in which they sent in their milk. One of the suppliers, feeling aggrieved, had consequently taken his milk to a neighbouring creamery which was not visited by the Inspector, and was received with open arms. Though the Committee desired to have the visits of the Inspector, it was felt that unless all the neighbouring creameries were also visited, the balance of advantage was to discontinue the Inspector's supervision.

(107) One of the great difficulties a creamery manager has to contend with is the rejection of dirty milk. The suppliers of a co-operative creamery are often the members of the Committee which employ the manager and he is hardly in an independent position to reject their milk if he thinks it advisable to do so. If he is manager of a proprietary creamery and he rejects the milk as dirty, it is frequently taken to a rival establishment. If he accepts the milk for fear of losing a customer, it deteriorates the quality of the whole supply; it injures the quality of the butter and contaminates the separated milk. In some districts the creamery managers enter into a mutual arrangement not to accept milk rejected by any one of them, but it appears that this undertaking is not always loyally adhered to. Usually the competition is too keen for such an agreement to be made at all. Of the need of inspection we have no doubt. It must not be forgotten that in many districts the inspection of cattle and cowsheds is nominal or non-existent. Many serious outbreaks of enteric fever have been traceable to separated milk from creameries (see Appendix C, p. 191, of Vol. 3 of Evidence), and we recommend that a central Department (preferably the Department of Agriculture, whose Inspectors have a practical knowledge of creamery work and its difficulties) should have compulsory powers to inspect all creameries and separating stations, co-operative and proprietary. The managers of good creameries do not object, the managers of bad creameries have no right to object. Inspection would be wholly good for the creameries. One manager admitted that his remonstrances with his suppliers were not as effective as those of the Inspector. The object of the inspection would be solely in the interests of public health, e.g., to see that dirty milk or milk brought in dirty cans or covered with dirty cloths, was rejected, that the machinery was kept clean, and that nothing was done which was inimical to the public health. The Inspector should have no right to interfere with the management of the business as a commercial concern. To ensure uniformity of treatment, a standard form of report should be used in every case, something after the style of that now used by the Inspectors in Dairying when reporting on creameries to the Department of Agriculture.

Paolo Wilson,
2467 A

Smith, 149,
22723-4,
Barnett, 10014-9.

Paolo Wilson,
2466,
2467,

2290

2400
2403.

Appendix C,
pp. 261-2, Vol. 1
of Evidence.

10071-4.

Barnett, 10074-5.

Wayte, 26214-21.

Appendix C,
p. 103, Vol. 1
of Evidence.

Barnett, 10060,
10093-14
Recommendation
Barnett,
10075-8, 10023,
10758, 10029-9.
Morrison,
20019-20,
Cusack, 10066,
Wayte, 26224-5.

T. J. O'Connor,
22792
Hegarty, 11723-6.

(108) Possibly improved methods of inspection of milk received at creameries would remove much of the cause of complaint as to the unpalatableness of separated milk. The dirty milk of one supplier will contaminate the milk of all the other suppliers. In heating the milk for the separation of the cream the milk is usually raised to a temperature which kills off certain bacteria which favour preservation of the milk, but not those which on multiplication rapidly cause the milk to putrefy. Fat inhibits to some extent the growth of bacteria, and after removal of the cream the separated milk is a more favourable medium for the growth of bacteria. All this is known, but the question at the moment is what can be done to the separated milk which will, whilst destroying many bacteria, not render it less valuable as a food. Milk-separated milk—intended for the food of man might be treated differently from that returned by the creamery for the feeding of calves, swine, etc. A certain proportion of the separated milk, according to the demands of the locality, could be pasteurised by the "holder" process—that is, pasteurised by keeping the milk at a relatively low temperature for a certain period of time. Exposure for a long time at a temperature of, say, 140° F. is more effectual than at a higher temperature for a short time. Moreover by a simple expedient the whole bulk of the milk could be brought to this temperature which would not devitalise the milk. The pasteurised milk should then be rapidly cooled and distributed, but only into cans, etc., which had previously been scalded or otherwise effectively cleaned. It is no use pasteurising milk if the fluid is to be placed in cans, etc., which are dirty, the dirt in the receptacles will negative the pasteurisation process. Separated milk for human consumption should therefore be pasteurised and we do not anticipate any serious difficulty in treating such milk in the creamery. The remainder of the separated milk required for the feeding of calves, swine, etc., need not be treated unless it is known to contain the germs of tuberculosis. The ordinary organisms contaminating milk and which may cause infection in man, giving rise to gastro-intestinal disturbances for instance, are not likely to cause any ill-health in calves and swine. It is not conceivable, for instance, that the milk can, under any circumstances, contain as many organisms as certain drinking water available for these animals. We are not satisfied of the necessity of pasteurising milk for animal consumption—save in the circumstance already noticed, and then it would be wise to destroy the milk absolutely—and we do not recommend wholesale pasteurisation under existing circumstances. Our conclusions as to the necessity, therefore, of pasteurisation only emphasises the need of thorough cleanliness in handling the milk, and that all vehicles for its conveyance must be as clean as possible, so that secondary contamination may be prevented.

Recommendation.
 Peck, Wilson,
 2450-61,
 Mountain,
 29946

(109) Another recommendation we desire to make is that the contents of the creamery separator should be burnt or otherwise effectively destroyed. Frequently it is thrown out on the refuse heap and eaten by animals. This sludge is particularly liable to contain pathogenic germs.

ENFORCEMENT OF THE DAIRIES ORDER.

(110) In Section 64 we showed that if the Dairies, Cowsheds, and Milkshops Order of 1908 were efficiently enforced by the local authorities, much of the commonest and most serious forms of contamination of milk could be prevented. Representative witnesses speaking on behalf of milk producers and milk vendors, and persons of both classes giving their individual opinions, have stated that they find no fault with the provisions of the Order—they are not too stringent and do not injure a person in the dairy business, but, on the contrary, are beneficial to the trade. Of the beneficial results following the issue of the Order there is ample evidence. The standard of cleanliness, etc., in cowsheds has been raised. Owners who have at first unwillingly made improvements in compliance with the Order have afterwards come to the Inspector and admitted that the alterations had been good for the health of the cattle; undoubtedly they had been good for the purity of the milk. The effectiveness of the Order depends primarily upon the vigilance of the officers appointed to enforce it; secondly, upon the willingness of the local authority to act on the reports of their officers and to support them in their executive duties; and lastly upon the manner in which magistrates deal with persons prosecuted for breaches of the Order.

In county boroughs and urban districts veterinary inspectors have, so far as we know, been appointed in all cases. In the larger towns there is also usually a lay

Hatch, 3160-4,
 Moorow, 7437-31.

5925-9, 10298-5,
 10871-2, 11718,
 11922-3, 10431,
 7943-4, 9228-4.

Hosford, 10189-
 42, 16473-9
 P. Burke, 21698,
 21501-3,
 Hyman, 22906.

inspector of cowsheds and an inspector of milkshops; in the smaller towns the sanitary officers act in both these capacities. The supervision is generally efficient, but exceptions have come under our notice. The same remarks do not apply to many rural districts. We have had evidence that in some of these districts veterinary inspectors have not been appointed. In other cases where veterinary inspectors have been appointed, the compliance has been perfunctory or nominal, the remuneration offered being such that no professional man could possibly be expected to discharge all the duties required by the Order. One ex-veterinary inspector said that the salary offered would only pay the whip money of his car drivers. Direct evidence of the failure of rural councils to appoint lay inspectors to supervise the conditions under which milk is produced (*e.g.*, the condition of the cow byre, the cleanliness of the milkers, etc.) has not been considerable; probably in many instances the veterinary inspector discharges these duties; but indirectly we have received ample evidence that there is generally a serious failure in rural districts to enforce the provisions of the Dairies Order.

Smith, 22-5.

P. Power, 22638.

Dobbin, 20295.

Hyne, 22886.

22945-6.

Harris, 22922.

(111) To give an example of what we refer to, the Public Health Committee of the Belfast Corporation tendered as a witness their lay inspector of cowsheds, who from time to time unofficially inspected and reported on a considerable number of cow byres in districts outside the jurisdiction of the Corporation. We quote two samples of his reports, one dealing with the general condition of a number of byres, the other giving details of a particular case. We have taken the first two cases mentioned by him, so as to avoid the suggestion that the worst cases were picked out:—"On the 12th inst., I attempted to inspect sixteen dairy farms outside the County Borough of Belfast, in County Antrim, from which milk is consigned to the city; in six instances I was refused permission. In the townlands which I visited I found no improvement since my former visit in March, 1911. The buildings are of stone and lime, and quite a number are thatched, the walls inside are rough, broken, dirty, and covered with dust, while the ceilings are festooned with cobwebs; the light and ventilation are defective; the floors are paved with stones and dirt, which is unsuitable, as it is quite pervious; there is no provision made for drainage. In many instances the manure heap is only a few feet from the byre door. Judging from the condition of these cowsheds, in my opinion the milking could not be carried on in a cleanly manner. I may add that in two cases the owners informed me the byres had not been cleaned for three days; I found in two cases pigs under the same roof with the milch cows. Two of the above dairies have never been registered nor inspected."

McBride, 6728.

"Another case, November, 1909. That in the occupation of Mr. —, County Down. This dairy is registered and officially inspected. No windows nor provision for ventilation; no drainage; floor paved with stones and earth; full of holes and accumulation of liquid matter; walls rough and pervious; have never been lime-washed; manure heap against gable of byre. There are two byres, both similar. I found in No. 1, two brood sows; in No. 2, 5 cows, 1 bull, and 3 pigs, which were in a dirty condition, with no bedding of any description about them. It would be impossible to describe the condition of this place, as both outside and inside are in a lamentable condition. Thirty gallons of milk are sent to Mr. —, Belfast, daily. Mr. — has been delivering milk in Belfast for the past six years."

The City Veterinarian of Belfast also spoke of byres in outside districts which he had visited; he said, "Generally speaking they could not be worse—absolutely filthy in some cases—low ceilings, neither light nor ventilation, dirty cows, badly bedded, defective floors—everything that you could really think of. It would not be possible to get a pure milk supply out of byres like what I saw." The witness added that some of the owners of these byres "thought they were doing grand." They did not think they had dirty cows or byres, or anything to do with dirty milk. It seemed to be entirely want of education.

Jordan, 7112-4.

These facts are eloquent of the manner in which the Dairies Order is administered in some of the rural districts.

(112) The reasons for the difference in the administration of the Order in town and country are not far to seek. We mention them because they lead to the consideration of the proposals we shall make as a remedy. In large centres of population the observance of sanitary regulations is indispensably necessary to the maintenance of public health. The regulations are, speaking generally, carefully drawn up to safeguard public health and are vigorously enforced, otherwise nature quickly

exact a penalty; and, in a densely populated area, what injuriously affects one section of the community is liable to affect all. Even if an outbreak of infectious disease could be restricted to a limited area, the ratepayers as a body are interested in the maintenance of the well-being of the whole population. We found accordingly that in cities and urban districts the cattle, the byres, and the milkshops were under inspection; that vigilance was exercised to detect adulteration; that in Belfast samples were taken to ascertain if milk was free from infection, and that if more active steps were not taken to prevent dirty milk coming in, it was owing to the limitations of the executive power of the authorities.

On the other hand, in the country the enforcement of the Order rests in the hands of councils composed largely of persons who are either in the dairy trade themselves or susceptible to the influence of those who are. The milk produced, when not sent to a creamery, is consumed for the most part in another area. The necessity for observing the laws of hygiene is not so fully appreciated in the country as in the town, and the consequences of neglect are not so apparent, as the danger is transferred to another centre. The object of the country dairyman is too often to produce his milk at a minimum of expense, regardless of the hygienic conditions under which it is produced, and not unnaturally, perhaps, his neighbours sympathise with this object and even benefit by it. This is really a short-sighted policy; in the long run it would be more profitable for the dairyman to have healthy cattle in healthy byres; and until this view prevails and the country producer competes with the town dairyman on equal terms, the latter is at a commercial disadvantage. This, indeed, has been the subject of serious complaint and is one of the reasons, and an important one, why city authorities have asked for extended powers to enable them to secure a uniform administration of the Order. Indirectly, too, the unfair competition inflicts an injury on the consumer. The city dairyman's expenditure in producing milk is increased by the rigid requirements to which he is subjected; as compared with his rural rival, he is sufficiently handicapped by the cost of feeding stuffs, which he does not raise himself but has to buy; he has a higher rent to pay for his premises and higher wages to pay for his assistance; and naturally he looks for a remunerative price for the article he sells. If then, by unequal competition, he cannot command a price which yields an adequate profit, the respectable vendor is driven out of the trade, which tends to fall into hands less desirable from the point of view of public welfare. The remedy which has been called for most generally, particularly in Dublin, Belfast and Cork, has been that borough and urban authorities should have the right to send their officers into outside districts to examine into the condition of the cattle and cowsheds from which milk supplied to the city is produced. Where the conditions are unsatisfactory, failing other remedies, the city authorities claim the right to forbid within their area the sale of the milk from that farm.

(113) Under Section 19 of the Tuberculosis Prevention (L) Act, 1908, an urban authority may be invested by the Local Government Board with powers of control over outside dairies from which the milk supply of their district is derived, and applications for such powers have been made by the health authority *inter alia* of Dublin, Belfast, Cork, Bangor, Newry, and Rathfriland. In dealing with applications of this kind, the Board have been in the habit of asking for particulars of specific instances of default on the part of the outside authority, as they consider that one authority should not be superseded by another in its own jurisdiction without strong grounds. Mr. Galvin, Solicitor to the Cork Corporation, and Mr. Watson, Chief Veterinary Inspector for Dublin, contend that this is a wrong method of proceeding. The case presented by Mr. Galvin is:—

"At this moment the Corporation have no legal authority to expend one penny in investigating the condition of these outlying dairies and cowsheds. They have no power to enter, or to authorise one of their officers to enter, any such premises, and if a person purporting to act upon their behalf insisted upon examining a dairy outside the urban district, he would be breaking the law of the land, and legal proceedings could be successfully maintained against him. In view of this state of things the suggestion that explicit evidence must be produced by the Corporation in support of the allegation of default is simply a *reductio ad absurdum*, and if the Board adhere to this proposition I fear that the effect of their doing so will be to render absolutely useless the statutory provision already referred to."

Hatch, 8178-9,
McGrice, 4639-40,
Jordan, 7118-9,
C. Bass, 7616-7,
7547,
J. A. Thompson,
7162,
Crosswell, 9221-4.

B. C. Galvin,
22115,
Smith, 27703-131,

Watson, 1586

B. C. Galvin,
22115.

"I am bound to say that the Local Government Board misapprehended, and still misapprehend, the intention of the Legislature with regard to that section and its legal effect, because they took the narrow ground that what was sought was in effect the transfer of the powers of the dairies in the rural district to the urban authority. I do not think that was the intention or the effect of that section. I think the section, as a matter of English, speaks for itself, and what it means is that the Local Government Board were empowered to give to urban authorities control over the milk supply of their district wherever it came from—that is to say, that the section is sufficiently wide to give the Local Government Board power to transfer to the Corporation the right of examining dairies from which the supply to the city comes, and I think the object of that section was to give large towns and cities power to supervise properly all sources from which the milk came into their district."

(114) We can understand the reluctance of the Local Government Board to confer indiscriminately the powers mentioned in section 19 of the Act of 1908; the Dairies Order makes the Rural District Council the executive body in its own district, and to issue an Order under the Act of 1908 would create dual administration in a Rural District. The result in practice might not be altogether effective. Thus, a cowkeeper in a rural district who, in consequence of an Order made under section 19, became subject to inspection by the officers of (say) the Belfast Corporation, could avoid the inspection by sending his milk to another town, say, for example, Armagh. Unless the urban authority of that town then obtained an Order from the Local Government Board, the evil would not be cured but only transferred from one town to another. There are other objections to which we shall refer later. Up to the present, no Order conferring powers of control over outside dairies has been issued, and section 19 of the Tuberculosis Prevention Act has been a dead letter, except so far as the Local Government Board have held it in *terrorem* over a district which neglected to enforce the Dairies Order. Nevertheless, in spite of the obvious objections to the conferring of the powers indicated, it is the remedy provided by the Legislature, and we think that after the five years which have elapsed since the Dairies Order came into force, it might be desirable for the Local Government Board to reconsider their policy. We are not unmindful of the danger of friction arising where two local authorities exercise a similar power in the same area, but we believe that on the whole the granting of powers of outside inspection to an urban authority would be salutary where *prima facie* grounds for complaint exist. The Medical Inspector could make personal investigation, as he did in the case of the Cork Rural District. This is not the true remedy for the evils alleged; but legislation will be necessary to give effect to the proposals we suggest, and in the meantime the machinery which exists might be tried for what it is worth. The main outside sources of supply of a city are usually in the immediate vicinity; and the city authority, if given power to inspect dairies in adjoining rural districts when neglect to enforce the Dairies Order in those districts is alleged, would probably be satisfied in most cases. One matter in particular calls for attention. Cows which are housed in winter in Dublin, Belfast, and other cities, are usually sent to grass in adjoining districts during the summer. Neither the cows nor their milkers are then subjected to supervision; the rural authority does not consider they belong to the district, and the city authority has no power to follow them. Either the cows and their milkers should be inspected by the officers of the rural district in which they are located for the time being, or the officers of the city from which they come should have power to exercise supervision over them.

Recommendation.

B. C. Galvin,
18140-1.

O'Donoghue, 715.
McGrane, 4649-52.
Richardson,
4748-52.
Mason, 932-4.
A. Watson,
1577-8.

(115) To come now to the remedy which commends itself to our judgment. It was represented to us in Ireland that many cities in England and Scotland possess under local Acts powers which enable them to prevent the importation of tuberculous milk; that these powers have been exercised with considerable advantage to the health of the cities concerned, and it was recommended that similar powers be given to Irish towns. Being much impressed by these views, we visited England and took evidence from the Medical Officers of Health of Manchester, Birmingham, Liverpool, Glasgow, Sheffield and Leeds. The procedure for the protection of the public health against infected milk is practically the same in each of these cities. Samples of the milk coming into the city from outside are taken at the railway station, they are bacteriologically examined, and if tubercle bacilli are found the Veterinary Officer is empowered to go to the farm from which the infected milk came, and examine the herd. If a cow giving tuberculous milk is discovered, the

Hitchcock,
33701-6
Mason, 31330-3.

Scott, 32552-7, 32553-54.

Bellisbrook,
30713-5, 30739.
Moleston, 31061-2,
32184-5.
Dress, 31196-218
Quinton, 32693-7.

Scarfild, 32690.
Moleston, 31064,
31964.

Quinton, 32699-
700, 31709-12.

Appendix B - p.
365, Vol. I of
Evidence.

Muse, 32426.

Scarfild, 32649-
50, 32657.
J. S. Cameron,
32667, 32144.

3272, 17826-70,
23112-7, 23289-92.
304-14, 3745-7,
3939-22, 14394-3,
27123-30, 28097.
415.
394, 25042-6.

320, 4544, 25668.
91.

owner is forbidden to sell the milk of that cow in the inspecting officer's area. The slaughter of the cow could not, however, be insisted on before the issue of the recent Tuberculosis Order of 1913; consequently, each city was left to protect itself against infected milk, and by doing so drove the tuberculous milk into other districts which had not the means or energy to protect themselves. If, in the course of inspection, the Veterinary Officer sees defective or dirty byres, he does not direct that the byre shall be made to conform with the provisions of the Dairies Order or be made clean; if he takes any action at all, it is to report the case to his Medical Officer of Health, who in turn informs the Medical Officer of Health of the district in which the byre is situated. A drawback to the English procedure is that the cost of carrying out a systematic inspection would be prohibitive. In Birmingham, for instance, the average yearly number of inspections of this character for the past ten years has been about twenty; in Liverpool, during the same period the average number of inspections has been eleven. It also results in two or more cities doing the same work twice over. For example, Manchester and Birmingham both draw milk supplies from Shropshire. It would be a more satisfactory solution of the problem if some authority in Shropshire did for all the cattle and milk of that county what Manchester and Birmingham are doing for themselves.

These are the objections that present themselves to us when it is proposed to give to cities like Dublin and Belfast general powers of outside inspection as a protection against the reception of dirty milk. Dublin draws large supplies from the Counties of Cork, Tipperary, Longford, Roscommon, Wicklow and Wexford; the cost of even occasional visits to country dairies would be a serious financial burden, though not, we admit, incommensurate with the benefits that would be obtained. To take another aspect of the question, Dublin and Belfast draw supplies from County Sligo. Let us suppose there is lax administration of the Order in a milk-producing district in that county, and that Dublin and Belfast exercise the powers of outside inspection, there would be a double expense, and in the end it might result that the milk supply was merely diverted to another area, whereas if there were a uniform enforcement of the Order all over the country, it would be unnecessary for any one district specially to protect itself. Finally, the English procedure is not suitable for Irish towns, because the object of cities like Manchester and Birmingham is primarily to exclude milk infected with tubercle bacilli. They have the equipment which enables them to detect the presence of tubercle bacilli in milk; without it, their powers of outside inspection would be useless. The whole object of the outside inspection is to discover the cow which gives tuberculous milk. If milk is suspected of conveying scarlatina or diphtheria action is taken not under the Milk Clauses of the local Act, but under the Infectious Diseases (Prevention) Act of 1890. The condition of the country cowsheds as regards drainage, size, and cleanliness, is at least a subsidiary matter of importance and is often treated as negligible by the city inspecting officer. The representations made on behalf of Irish towns have been directed to the ascertainment primarily of the condition of cow byres, and secondarily to the health of the stock. In England, an outside inspection is not made without some proof that the milk received from outside sources is infected; in Ireland, in the absence of means of making a bacteriological examination of milk, there cannot ordinarily be ground for suspecting the presence of tubercle bacilli in milk. If, therefore, an Irish city desires to have the power to inspect rural dairies which send milk into the city for sale, the only course pending legislation would be to obtain that power under section 19 of the Tuberculosis Prevention (I.) Act, 1908.

(116) The existing procedure for the enforcement of the Dairies Order is open to serious objections on the ground that there is not a uniform standard of administration and that there is duplication of work, which causes unnecessary expense and does not secure efficiency. As regards unequal administration, in some districts the Order is rigidly enforced, in others it is partially enforced, while in others it is not enforced at all, or so laxly as to render its effect of no use. The efficient administration of the Order is not even indicated by the appointment of Veterinary and Dairy Inspectors. Of course where no inspector is appointed the Order is a dead letter, but there are districts where either the Veterinary Inspector is paid a nominal salary, or where the reports of the inspector when received by the local authority are ignored. For this state of affairs we see under existing circumstances no remedy. Supposing the hesitation of the Local Government Board to the exercise of the right of outside inspection under section 19 of the Tuberculosis Prevention Act to be overcome, we do not see that the inspecting officers could do more than call

the attention of the local authority to any unsatisfactory condition, such as cattle suspected to be diseased, insanitary byres, or dirty milkers, that might be discovered. The powers of the Local Government Board are for the most part persuasive, not mandatory, in dealing with an authority which neglects its duty in regard to the Order. The Board has shown that it can insist on the appointment of a veterinary inspector by an unwilling rural district, but further steps are necessary to insist that district councils shall give effect to the spirit of the Order.

South, 22-5,
Lough, 45-6,
St. Gallagher,
27-122-4,
South, 27-702.

(117) As regards duplication of work and unnecessary expenditure, it may be stated that there are in existence three sets of veterinary surgeons performing public duties. (1) The veterinary inspectors who are appointed to enforce the Dairies Order by urban and rural district councils by virtue of powers conferred under the Public Health (Ireland) Acts; in respect of such duties the local authority is responsible to the Local Government Board. (2) Under the Diseases of Animals Act, 1894, the county councils are empowered to appoint veterinary surgeons for the purpose of detecting and stamping out as quickly as possible certain scheduled diseases of animals, such as anthrax, pleuro-pneumonia, foot and mouth disease, etc. For the performance of these duties the county councils are responsible to the Department of Agriculture. (3) Finally, there are veterinary inspectors directly appointed and employed by the Department of Agriculture also under the Diseases of Animals Act. Thus there are in existence three sets of veterinary officers dealing with the health of animals, subject to the supervision of two different Departments and under the control of two independent local authorities. Such an arrangement is conducive neither to economy nor to efficient administration. At present the inquiries of the County Council Veterinarian are restricted to certain specified subjects, not because he is not competent to deal with the whole range of questions coming within the professional knowledge of a veterinary surgeon, but because his appointment strictly limits his activities and his jurisdiction. If, for example, in following up a case of anthrax the county inspector visits a byre which obviously does not conform with the requirements of the Dairies Order he is silent, because it does not come within the scope of his duties to make representations to the owner concerning it. Such a system is indefensible from the point of view of economy: it involves two sets of inspectors of the same profession travelling about the country to perform different duties which either is capable of discharging in entirety. And worse, the system tends to weaken the authority of the rural inspector, and to make his work more difficult. Continuing the foregoing suppositious case, let us suppose that the local inspector, following the county officer, visits the faulty byre and requires the owner to make certain alterations. The cowkeeper, not able, and perhaps not anxious, to distinguish the niceties between the functions of the county inspector and those of the rural inspector, and believing not unnaturally in the superiority of the former, will possibly reply, "Mr So and So (the county officer) saw the shed as it now is and never made any objection to it; it could not have been wrong or he would have said so, and why are you making all this fuss about it?"

(118) The urban and the rural district veterinary inspectors are responsible only to the authority which makes the appointment. In rural districts the clients of the veterinary inspector are often the members, or relatives of the members, of the district council. Without reflecting on the integrity or disinterestedness of the veterinary inspector, it is obvious that he is in an extremely invidious position if he has to insist on the observance of the Order in opposition to the wishes of a milk producer who is both his client and a member of the local authority. An inspector who can combine the *saxeriter in modo* with the *fortiter in re* will, no doubt, be able to accomplish a large amount of useful administrative work without having recourse to extreme measures; but the fact remains that he may have to deal with cases where persuasion fails, and in such cases unpleasantness and hardship are entailed if an officer has to choose between discharging his public duty and offending an influential client. The difficulty of the position is intensified where an inspector may be somewhat lacking in the tactful handling of an awkward case. These views have been presented to us by witnesses who were acting as veterinary inspectors but who were in no way speaking in complaint or under a sense of grievance. Their suggestion was that if they were given a position which made them independent of local influences, e.g., made whole-time officers for fairly large districts, and were subject to the supervision of an official acting on behalf of a central body, their authority would be immensely strengthened. The district inspector would then be in a

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position to say to a cowkeeper who was reluctant to make, say, necessary alterations—
 "Under the Dairies Order these alterations must be made. It is actually in your own interest that they should be made. But in any case, if you do not make them on my instructions you will have to make them when the chief inspector comes round, so you may as well make them now and not get us all into trouble." Such an appeal we conceive could seldom be made in vain, and is a powerful argument in favour of supervision by the inspectors of a Central Authority.

(119) The difficulties of securing adequate enforcement of the Dairies Order by local authorities under existing conditions are practically insuperable. The Order was drawn up by the Local Government Board in collaboration and consultation with the Department of Agriculture. So far as the Public Health is concerned, its administration is a matter for the Local Government Board, and at present in its entirety it is administered by that Board. But the Order deals principally with the health of cattle and their housing, and in the urban and rural districts it is the Veterinary and Dairy Inspectors who are the executive officers. The Local Government Board have no Veterinary Inspector attached to their staff and we do not recommend that they should have. On the other hand, the Department of Agriculture has a large staff of veterinary surgeons who are well qualified to act as supervising inspectors. It would be impossible to transfer the administration of the Order from the Local Government Board to the Department of Agriculture, concerned as the Order so largely is with the public health: at the same time it would equally be inexpedient to entrust the Local Government Board with powers properly appertaining to the Department. A *modus operandi* is required which will retain all matters pertaining to the public health in the care of the Local Government Board and transfer all that relates to the health of cattle to the Department of Agriculture. It is not easy to draw the line of demarcation so long as the urban and rural councils are the local administrators of the Order. We suggest, therefore, that the unit of administration should be the county or the county borough, which, after consultation with the Department of Agriculture, should divide the administrative area into a number of districts, mainly on the basis of cow-population, and should appoint a whole-time Veterinary Inspector (who should be a qualified Veterinary Surgeon) to each district. A scale of salary should be drawn up, also in consultation with the Department; one-half of the salary should be payable by the county authority out of the rates, and the other half should be paid from Imperial Funds through the Department, on the same principle that the State now contributes towards the cost of county veterinary inspection. The Department should have power to withhold the State contribution, or part of it, if the work of veterinary inspection were inadequately carried out. On the appointment of veterinary inspectors, existing officers should be given the preference, and existing officers who were not re-appointed should receive some compensation. Attached to a county or group of counties there should be a Chief Inspector, appointed by the Department, he should be paid wholly by the State and be responsible to the Department, but would, under the instructions of the Department, advise the county authority on all veterinary questions, and should have power to act as supervisor over the District Veterinary Inspectors. Each District Veterinary Inspector should be responsible for all matters relating to the health of cattle in his district, the condition of cow byres, and the administration of the Dairies Order generally. He should also act as a local officer for the enforcement of the Diseases (Animals) Act; the State contribution towards his salary would entitle the Department to call on him to discharge such duties. The District Inspector would report to the county authority; the Chief Inspector should have the right of access to all such reports, and should keep the Department informed on all matters of importance or on which he was instructed to report. The Department in turn would communicate to the Local Government Board any matters which came to its cognisance through the Chief Inspector which affected the public health, and which rightly belong to the functions of the Board.

(120) There will always arise questions of policy or administration in dealing with the public health or the health of cattle which, though primarily affecting one of the two Departments, does also concern the other Department to a greater or less extent. The Local Government Board have, we understand, conferred from time to time with the Department of Agriculture on matters relating to the Dairies, Cowsheds and Milkshops Order. We consider that this arrangement should be officially recognised and put on a permanent footing, so that it will be secure against

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 Harris,
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alteration on a charge of personnel or any other cause, and so guarantee a continuity of policy. A co-ordinating committee composed of representatives of the two Departments should be appointed to deal with all matters in which the two Departments are concerned. The constitution of this Committee we would leave to the Departments concerned, stipulating, however, that it should have adequate medical and veterinary representation and that it should meet at stated intervals. Our suggestion involves that the responsibility of reporting on the manner in which the Dairies Order is administered should be thrown on the Department of Agriculture, whose veterinary staff should be strengthened so as to ensure that the whole country will be under their supervision.

(121) It was suggested that it would be inconsistent to have whole-time Veterinary Inspectors and not to have whole-time Medical Officers of Health. We agree, and though it is not in our province to make recommendations on the subject, we may point out that one of the advantages of making the county the administrative unit and appointing County Veterinary Inspectors would be that it would make possible the treatment of the Poor Law problem on similar lines, *e.g.*, the appointment of whole-time Medical Officers of Health. It is complained both in the case of the Medical Officer and the Veterinary Inspector that local influence and dependence on persons who may at the same time be clients and district councillors, make the efficient discharge of public duty by the professional officer extremely difficult. We refer without comment to the evidence given by Dr. Moore Betty (of Enniskillen) as to the advantages that might follow from the appointment of whole-time medical officers by a central or county authority to report on the health of districts—see questions 26280-91 on page 6 of the 3rd vol. of Evidence

Session, 32-33-791.

82174, 32-33-8.

(122) To revert to the advantages that would arise from the adoption of the foregoing proposals, we may state that the appointment of supervising officers would ensure not only the efficient but also the uniform administration of the Dairies Order. Their existence would obviate another very thorny difficulty, to which we referred at length in section 114, *viz.*, the conflict arising between town and rural authorities as to the adequate enforcement of the Order. Suppose the city authority of A found fault with the condition of milk coming from the rural district of B, and attributed the cause to inefficient administration of the Order in that district, instead of applying to the Local Government Board for power to make an inspection of the cow byres in the district of B, they would communicate with the Department of Agriculture, which in turn would direct the Chief Inspector of the county to make an investigation and report. If the complaint was discovered to be well founded the remedy could be applied by the Inspector, and in the meantime until matters were rectified the city authority of A would have the right to refuse to allow the sale in the city of milk coming from the offending quarter. If, on the other hand, the Inspector reported that there was no ground for suspicion or complaint, the city authority would be bound to accept that decision. The Chief Inspector being impartial between the two parties would command the confidence of both and no friction would arise. By these means we consider that a very serious and a very real cause of friction between local authorities would be removed.

(123) To sum up, the advantages of adopting our recommendations would be that, without creating a new Department or appointing new officers, there would exist a Central Authority, with a staff of veterinarians, which would have the means of securing a uniform and efficient administration of the Dairies Order and the Diseases of Animals Acts at a minimum of expense. The Central Authority would have direct relations with the Chief Veterinary Inspectors in each county and would thus be able to obtain prompt and reliable information on all matters pertaining to the health of cattle, such as the nature and incidence of disease, the predominance of one disease over another in different localities, the probable causes, the accommodation for housing the cattle, etc. Knowledge concerning these matters might be made a starting point for the giving of advice or instruction as to the means of stamping out diseases prevalent in different districts. Especially it might be utilised for the detection of all cows with tuberculous udders, or suffering from tuberculosis with emaciation. And finally, we believe that by the adoption of our proposals friction between urban and rural councils arising from the claim of urban authorities to make inspections outside their districts would to a large extent be avoided.

(124) The public health and the health of cattle are so closely connected that perhaps the ideal mode of treatment would be the establishment of a Bureau of Health as a separate Department, such as exists on the Continent and in the Colonies, composed of medical and veterinary members of high standing, assisted by a staff of bacteriologists and biologists, and exercising supervision over a number of county whole-time medical officers of health and veterinary inspectors. As it might be considered that it would be beyond the scope of our Inquiry to recommend the formation of such a Bureau, we have confined ourselves to what we believe to be, under existing conditions, a practical method of dealing with the difficulty of securing efficient administration of the Dairies Order and Acts relating to public health and diseases of animals.

SUMMARY.

(125) To summarise our recommendations, we suggest that in cities and large towns power be given to the local authority to contribute towards the cost of establishing Infants' Milk Depôts (see section 16), that in small towns where there is scarcity of milk, depôts on the model of the Naas Milk Depôt should be opened (see sections 17 and 18); and that urban authorities be empowered to open milk depôts as suggested in section 21.

In rural districts we recommend the organisation of a demand for a regular supply through the agency of Milk Clubs, and the utilisation of creameries as a means of supply (section 36, 37 and 44). For the relief of scarcity in winter we consider that a large extension of winter dairying is necessary (sections 38 to 42), and to this end we direct special attention to the value of Cow-testing Associations and the keeping of milk records (sections 54 and 55). Also we strongly recommend the provision of Cowplots for the grazing in common of labourers' cows (section 46) and the provision of means to enable labourers to keep and graze their own cows (sections 47 to 49). An improvement of the breed of goats would be useful as a means of relieving the scarcity of milk in the country, especially in remote and hilly districts (section 50).

As regards the purity of the milk supply, it is necessary to free our herds from cows which give tuberculous milk, and our views on this subject are set out at length in sections 58 to 63. In sections 78 to 88 we have indicated what amendments of the law are, in our opinion, necessary to prevent the spread of disease by infected milk, and in sections 106 to 109 we deal with the question of the inspection of creameries. We recommend certain alterations of the Dairies Order relating to the licensing, in lieu of the registration, of milk vendors and their premises (section 65) and the application of the Order to home-butter makers (section 66). We think it would be helpful if provision were made for the granting of smaller loans than those now available for the improvement of cattle byres (section 67). To our statements in sections 69 to 73, relating to fines imposed for breaches of the Dairies Order and for the adulteration of milk, we attach great importance. Also the law requires strengthening so as to enable samples of milk to be taken by Food and Drugs Inspectors (sections 75 to 77). A number of miscellaneous recommendations are made in sections 90 to 105.

Finally in sections 110 to 123 we have given our views as to the means necessary to secure the uniform and efficient administration of the Dairies Order.

(126) The members of the Commission desire to place on record their high appreciation of the very efficient manner in which the secretarial duties have been discharged by Mr. Strange. From the outset he has been devoted to his work, and he took infinite pains in procuring accurate and reliable information for the Commission. His ability in grasping the highly technical and scientific problems with which the Commission has had to deal, and the readiness with which he devoted

much of his leisure time to the work entrusted to him, deserve our highest approbation. In drafting our Report he has given invaluable assistance and the arrangements made for the convenience of the Commission have been most satisfactory.

We have the honour to be,

Your Excellency's obedient Servants,

P. J. O'NEILL, *Chairman*.
 STEWART WOODHOUSE.
 GEO. A. MOORHEAD.
 ALEC. WILSON
 DERMOD O'BRIEN
 J. R. CAMPBELL
 A. E. METTAM.
 SYLVIA V. EVERARD.
 MARGARET McNEILL

SIDNEY W. STRANGE,

Secretary,

5 Upper Castle Yard,

Dublin.

23rd October, 1913.

